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# Peter the Great and the Russian Frontier

by GLADYS SCOTT THOMSON

*Miss Scott Thomson is best known for her books about the Russell family and Woburn Abbey, seat of the Dukes of Bedford. She has also, however, written a most lively short biography of Catherine the Great in the "Teach Yourself History" Series; and her present article sets the frame for a portrait of historic St Petersburg by Lady Kelly, which we hope to publish in our October number*

"THROUGHOUT Russian history one dominating theme has been the frontier." That sentence was written by the late B. H. Sumner, sometime Warden of All Souls College, Oxford, whose untoward death deprived historians of a foremost authority on Russia. It is a remark supplementary to that made by another eminent authority, the late Professor Bury, when he pointed out that the expansion of Russia was the inevitable consequence of the geographical position of Moscow, far removed from Western Europe, yet with no natural frontier that might impose a line of demarcation. Had Kiev, once a frontier capital, the mother of Russian cities, retained its ancient prominence, the story might have read otherwise. But Kiev had undergone many vicissitudes, and when at last, in 1667, it was once more seized for Russia from Lithuania-Poland by Alexis, father of Peter, the centre of political gravity had shifted to Moscow and the expansion of Russia therefrom was under way. The long arm of successive rulers had stretched forth south and east and north, across the seemingly endless plains, forested, woody, grassy, as the case might be, sometimes arid, their most conspicuous feature the great rivers; to Astrakhan and the regions of the middle Volga; to the Urals; to Siberia. All this implied, on the one hand, the taking in of boundless districts of uncultivated, sparsely inhabited, sometimes totally uninhabited land; and on the other the absorption into Muscovy of divers races: non-Russian, in origin Asiatic rather than European; non-Christian, for the most part professing the Moslem creed. To bring these peoples under the government of Russia, for all their qualities of independence and hardihood, was comparatively easy. Such was not the case in the region of the Black Sea, whose shores had passed into the control of the Ottoman Empire, while between the northern shore with the Sea of Azov and the limit of the district effectively held by Russia lay a debatable

land some three hundred miles in depth, occupied by Crimean Tartars whose allegiance was to the Sultan and Cossacks whose allegiance to Russia was nominal. During the twenty years before Peter's accession two attempts to strike at the Black Sea fringe of the Ottoman Empire had proved abortive.

Among the earliest of Peter's projects for the great Russia of which he dreamed with himself as the great Emperor was a renewed attempt to force back the infidel and so restore the ancient track that before the stream of Moslem invaders had begun to come in the 10th century had been not only the great trade-route but no less the cultural connecting link between Russia, with its capital at Kiev, and Byzantium; and so on to the Mediterranean. His first attempt ended in failure. In his second campaign he reached the Sea of Azov and captured the fortress on its shore. With success his vision grew. He began to think in terms of a Grand Alliance of Europe directed against the Turks, with himself as its pivot. He was soon to learn that in terms of Western diplomacy, not to speak of trading considerations, the idea was a mere chimera. But the triumph at Azov had a practical repercussion. Peter perceived that any projected campaign against the Turks necessitated a fleet; and a fleet he would have, and trained sailors as well. Further, he saw clearly that although he might and did begin to build his ships he needed the experience that could only be gained in the West. Azov had fallen in 1696 and a two years' truce was entered into with the Turks. The following year numbers of young Russians were despatched into Western Europe for educational purposes but chiefly that they might learn the craft of the sea. Later in the year Peter himself, with a great retinue, followed them. He would see the West for himself as no Tsar before him had done; he wanted to see the shipyards and arsenals of which he had heard; there was the idea, though that



*Peter the Great's initial effort at expansion was aimed towards the Black Sea, against the Turks. In 1696 he took the fortress of Azov, when Russian ships first participated in military operations*

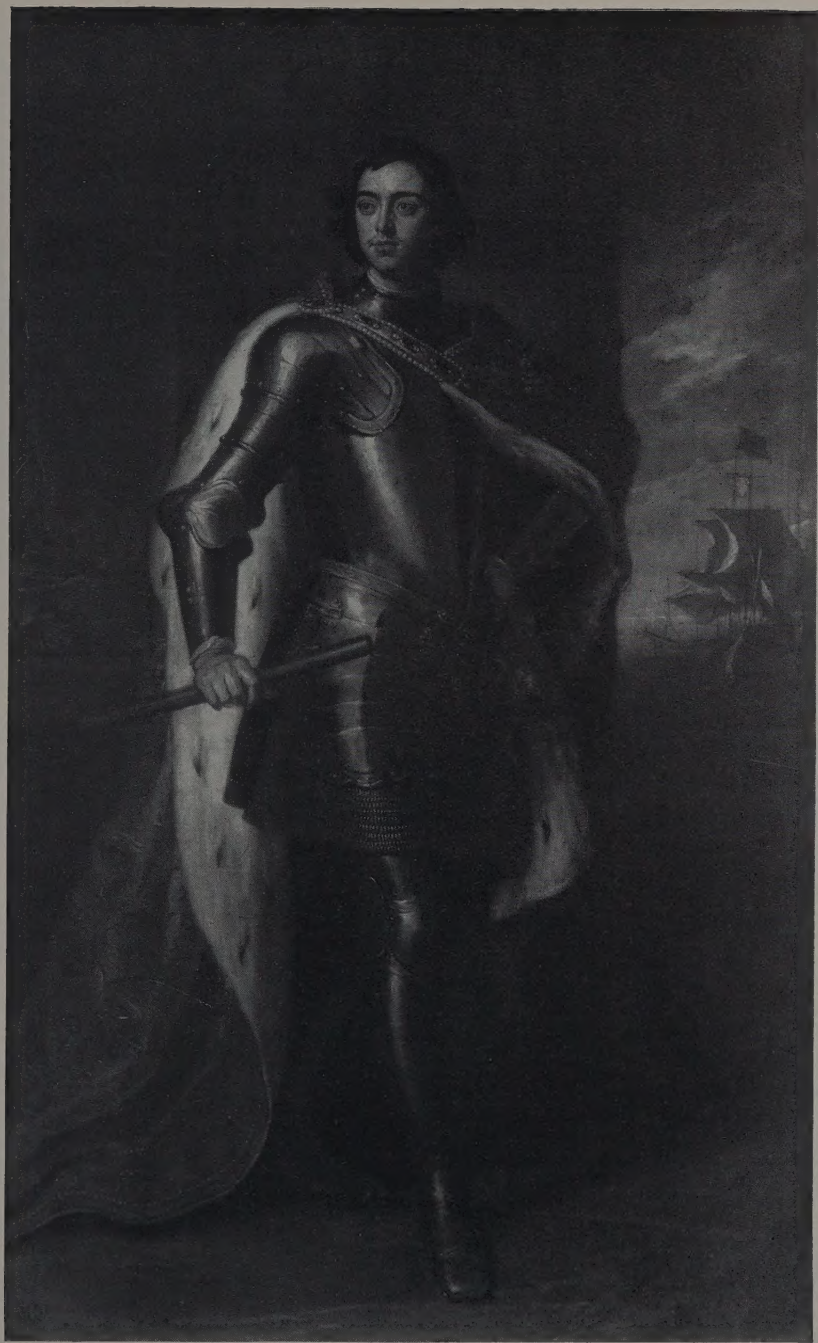
was soon to be dissipated, of the crusade against the Turk.

He spent five months in Holland, much of the time working in the East India Docks at Amsterdam. Thence he went to England, to sit, at the instigation of his friend and hero King William III, for his portrait to Kneller, to lease John Evelyn's house at Deptford—a lease which the owner had subsequent reason to regret having given, the damage done being portentous—and from that convenient centre to spend a great part of his time on the water studying shipping, and in the shipyards. It was the prelude to what was to come. To France he did not go. He suspected that country with her diplomatic support of Turkey in Europe was a prime factor in opposition to his crusade. He reached Vienna and intended to visit Venice, whither he had already sent an important group of Russians. But then he learned of trouble at home. The permanent Moscow garrison, known as the Streltsy, a hereditary privileged reactionary force, had staged a *coup d'état*. Peter returned to Russia.

When the revolt had been crushed, with ferocious cruelty, the pattern of events began

to take shape. Peter had observed the West, its customs, its civilization, its wealth, its trade, its armies and navies. These things Russia must have for her own. Hence the sometimes comic forcible ordinances such as that which forbade the wearing of the beard. Infiltration of foreigners into Russia there had long been, of Scots alone a goodly contingent, while the so-called "German suburb" on the outskirts of Moscow had harboured divers nationalities. These strangers had never been popular. Peter added to their number, bringing in more and yet more of deliberate purpose: engineers, shipwrights, doctors, any person who had a contribution to make to his plans for Russia. There were sweeping administrative, financial and legal changes. Finally there was the creation of what was virtually a new army; and the pressing forward of the building of the fleet. At Voronezh, high up on the Don, shipwrights, English, Scots, Dutch, mingled with their Russian mates and laboured to complete Russia's first navy, until in the summer of 1699 fourteen warships and Peter with them moved down the river to the new fortress of Taganrog which had been erected north-west





*Reproduced by gracious permission of Her Majesty The Queen*

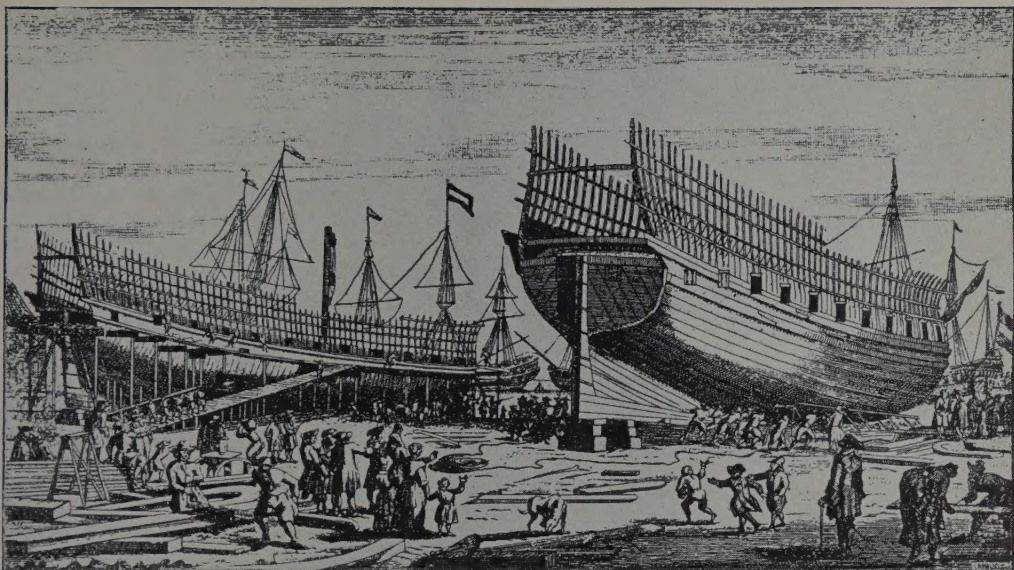
*Peter at twenty-six: painted by Sir Godfrey Kneller during his stay in England in 1698, the chief purpose of which was to study shipbuilding and naval organization*

The practical considerations which had impelled the progress to the Black Sea had been touched with romance, the romance of antiquity. Yet that progress halted. Peter had learned what the nations he had hoped for as allies thought about any serious attempt against the Turks. In spite of his success he may well have decided that such an attempt made by Russia alone was completely im-

Moving northward, along the western frontier lay Poland with which, after having shared a crown, Lithuania was now united in a kind of loose federation. Like her eastern neighbour she was a country of plains and marshes having no natural frontiers. Thus her geographical position made her vulner-







*The first Russian navy, as this contemporary print shows, was built at Voronezh, far up the River Don. Though it went into action in 1699, the Turks held too powerful a grip on the Black Sea; and Peter, unable to secure allies in his campaign, called off the attempt to expand southwards*

able. Her political vicissitudes, despite such brilliant interludes as the triumph of Sobieski over the Turks at the gates of Vienna, were rapidly rendering her still more vulnerable. Moreover if the Ottoman Empire represented the infidel, Poland with Lithuania stood for the Roman communion as opposed to the Orthodox Church, each regarding the other as schismatic with all the bitterness schism can engender. In the days of her greatness, Lithuania, expanding eastward, had taken the trading town of Smolensk from old Muscovy as she had taken Kiev; and Smolensk had become a fortress town bestraddling the path to the west, some two hundred miles from Moscow. It had been recaptured by Alexis almost simultaneously with the retaking of Kiev. Here was another possible road of advance. It was not one which Peter followed up. He was to find that Poland, given her political conditions, could be useful as a pawn and as a pawn she was used. Peter's thoughts had travelled further northward. It was a sea road and not a land road which called him.

In the extreme north Russia had direct access to the White Sea, as she had not to the Black Sea in the south. There, in 1585, thirty-two years after Chancellor's voyage, had been founded Archangel, a port for the

trade which sprang up between Russia and the West, particularly England and Holland, after the discovery of the White Sea route. But this outlet by sea to Europe was impassable during six months of the year, and at best long and circuitous.

There remained the Baltic. The importance of that sea as an outlet for Russia had long been recognized. But even as the shores of the Black Sea were controlled by the Turks, so were those of the northern sea by Sweden. Against her Ivan IV had flung himself in vain. Long years of fighting brought him no success and presently Gustavus Adolphus wrested from Russia the provinces of Ingria and Karelia which were her only foothold on the Baltic. Alexis did succeed in capturing the mouth of the Neva and part of the coast-line; but he had Poland as well as Sweden against him and went no further. Then, in 1700, the truce with Turkey having been confirmed and a treaty signed, Peter declared war on Sweden. The stage was set for a struggle that, seen from whatever angle, was dramatic in itself, and no less pregnant for the future. It was a clash of personalities as well as of forces. The House of Vasa had to its credit a long line of able rulers, under whom Sweden had consolidated her power and drawn to herself a number of subject lands. Now Charles XII





*In 1700 Sweden controlled the shores of the Baltic, to which Russia had no effective outlet. Peter determined to recapture the provinces of Ingria and Karelia, on the Gulf of Finland, which had been taken from Russia by Gustavus Adolphus in 1617. With Denmark and Poland as his allies Peter declared war on Sweden. The Swedish King Charles XII, then eighteen years old, met Peter's new army at Narva in November 1700 and signally defeated it. (Left) Charles XII, a portrait of 1701. (Below) Charles at the battle of Narva*

British Museum

Picture Post Library





had appeared, a military genius but with a streak in him as bizarre as much that on different lines appeared in Peter. Voltaire's judgment of the two men was that "*Pierre n'avait jamais fait la guerre qu'en politique, au lieu que Charles XII ne l'avait fait qu'en guerrier.*"

The inherent weakness in Sweden's position, not perhaps immediately apparent but clear enough in historical perspective, was that the group of lands over which she had taken control had no fundamental unity; and the fact that she held them excited bitter jealousy. Denmark and Poland no less than the northern German princedoms had every reason to resent Sweden's position and were ready to move against her. Charles flung himself eagerly into the fray. Frederick of Denmark was quickly defeated and forced to sue for peace. Charles turned towards Russia. In November 1700 the two armies met at Narva. It was a brilliant triumph for Sweden and a bitter humiliation for Peter, not himself present on the battlefield. The result revealed the two fundamental weaknesses of the army which he had so eagerly created. Everything had been done as Peter was so apt to do it, far too quickly. The training of the raw Russian recruits could not in the nature of things have been accomplished in the time. For the command Peter had perforce fallen back upon men of German nationality. The rawness of the soldiers, their dislike of their alien officers, together proved disastrous.

Much discussion can be and has been devoted to the argument as to what would have happened if Charles had pursued his advantage after Narva. It might well have meant that the westward expansion of Russia would have ceased, or at least have been considerably retarded. But "ifs" are more interesting than reliable. For Charles the position was plain. The enemy to be feared and to be trampled upon was Poland. He believed he had pushed Peter of Russia out of the way as he had pushed Frederick of Denmark. Riding the whirlwind and directing the storm, he swept forward to subjugate Poland; to replace its King, Augustus, by another, Stanislas, of his own choice; and to sign an agreement with him whereby they would if necessary wage war in common on Peter. This was left on one side for the moment. Passing onward Charles made himself master of Saxony; while Marlborough and Prince Eugene were fighting on the great plain of the Danube winning their victory of Blenheim. It was the age of great commanders.

To the east lay Russia, apparently out of the game whether diplomatic or political.

Those who thought this was so—and it was probably the greatest error committed by that most erratic genius Charles—were much mistaken. For Peter the years after Narva served as a breathing-space indeed, but not one of repose. Ruthlessly, with demoniac energy, he pursued his plans. Narva had taught him a great deal. He began again with the army. He began the creation of a new fleet to serve in the northern waters. Thanks to Alexis he held the mouth of the Neva, that delta of islands and waterways. On May 16, 1703, on one of the islands he laid the foundation-stone of what was to be the fortress of SS. Peter and Paul. He had decreed that a town should be; and a town arose, called after his name; built at the cost of untold misery and suffering and death. To guard the town a fortress, Kronstadt, was built at the river's mouth. For better communications—and it must not be forgotten that St Petersburg was from the first intended as a trading port as well as a symbolic city—a canal was planned to connect the Volga with the Neva by way of tributaries; and another to pass Lake Ladoga, that tempestuous water whence the Neva descended forty-six miles to the Baltic. Of that canal it was said it had cost as much in misery as St Petersburg itself.

To Charles XII these occupations of Peter afforded some scornful amusement. "Let him build towns" are the words accredited to him "and we will come and take them". In January 1708 the battle was set to begin. Charles crossed the Vistula. He might well have believed, as he did, in early and complete success. Behind him were his years of triumphant progress. In the diplomatic field he had played his hand, with both France and the Allies bidding for his support, better than Peter whose intrigues with the Western powers were of necessity played from weakness. Moreover Peter had roused in his own country, and he knew it, a sullen hatred and resentment. He had drained Russia of money; he had demanded labour at the expense of lives; he had married the servant girl, Catherine, who had for so long been his mistress. As he was to learn, there were still Cossacks in the south and the Ottoman Empire to be reckoned with. It was his good fortune that in spite of the blandishments of Charles the Sultan did not at once move. It was also his good fortune that Charles, looking at the Russian army in terms of eight years previously, knew no prudence. Poltava was fought on July 8, 1709. Four days later the remnants of Charles' scattered force capitulated to the pursuing



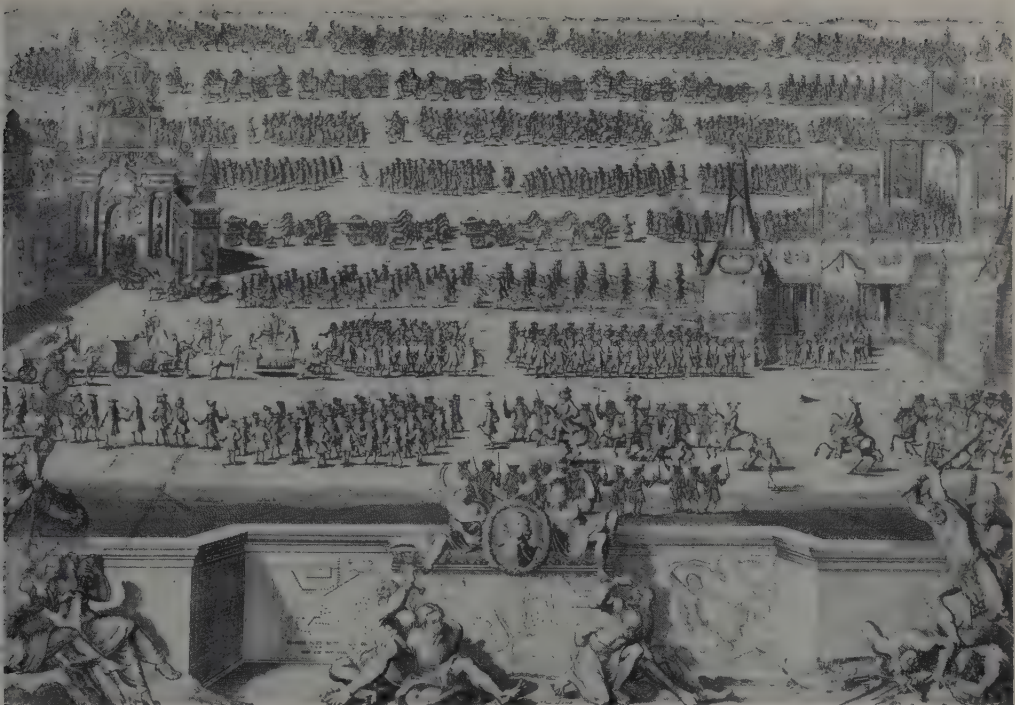
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Charles XII conquered Poland and placed a king of his own choosing on its throne. In 1708 he moved south-eastwards across Polish territory, in league with rebellious Cossacks, to attack the Russian army. But Peter in eight years had recreated this and on July 8, 1709, at Poltava, victory was his. (Above) Peter with his troops at Poltava. (Below) A medal struck to commemorate Russia's victory

British Museum







British Museum

*The triumphal entry of Peter into Moscow after Poltava : a grand display of Russian military might*

Russians. Charles himself, with the Cossack leader Mazeppa who had joined him, took refuge on Turkish soil. The way was clear for Peter to press forward to the Baltic waters.

Within the next five or six years Livonia, Esthonia, Viborg, the whole of Finland and the Aland Islands had fallen to Russia and a Russian navy had appeared in the Baltic to win a great victory at Hangö. It was a new kind of fleet. The expedition that Peter had sent to Venice had shown the kind of ships that would be most serviceable for movement among islands. It was a galley fleet which served Peter well in the Baltic. Yet even while these successes were accomplished Peter had had to learn another lesson. Charles was in Turkey; and in 1711 the Sultan was persuaded to declare war on the enemy of Sweden. The campaign on the Pruth showed Peter too prone to underestimate forces he did not fully understand, too ready to rely, as his opponent had also relied, on the conviction of success. It showed him without any possibility of misunderstanding that even he could

not at the same time fight in the north and in the south. The Russian troops broke. Peter perforce accepted terms, embodied two years later in the Treaty of Adrianople, in which he lost Azov and Taganrog; and, to all intents and purposes, his Black Sea fleet. It was the end of his Black Sea adventure.

In the Baltic the struggle continued, with Peter holding fast to all he had gained and withstanding the renewed attacks from Sweden led by Charles who had now made his way back. It was a long-drawn-out struggle, played against a diplomatic background which changed like a kaleidoscope; a story of pull devil, pull baker or, as it was put, "one ambassador flies out as another flies in". The salient fact was that not only had the appearance of Russia in the Baltic thoroughly startled Europe, especially England and Holland, but that also the Russian government was not now regarded as a pawn but as a power to be seriously treated with. Peter travelling abroad again, as he did during those years, was surrounded by all the prestige of a great monarch. Charles, his

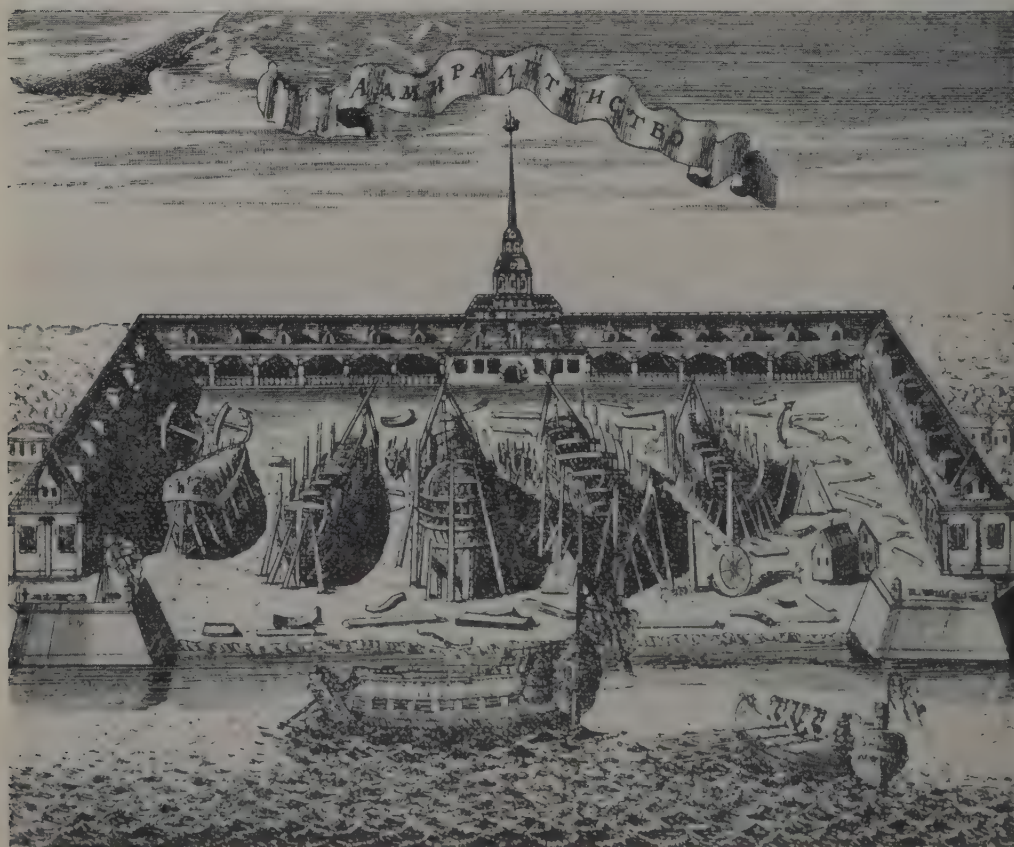
military genius failing, his diplomacy always weakened by the enmity of the neighbouring states towards him and his kingdom, more inept than before, died in 1718. In 1721 peace was signed at Nystad; a significant peace both for the moment and for the future. It gave Russia the provinces of Livonia, Esthonia, Ingria and part of Karelia. The rest of Finland, which had been badly overrun with much destruction, was released. But the Baltic coast from Riga to Viborg had passed into Russian hands and Peter had his opening to the West, with St Petersburg and its fortress at the mouth of the Neva. He was a sovereign power whom other sovereign powers were forced to take into consideration.

Sweden had fallen from her high estate and the Baltic was no longer a Swedish lake. She

never recovered her outlying lands, in spite of several vigorous attempts to do so. It was not only the might of Russia that opposed her but the age-long jealousy and hatred she had excited in the neighbouring lands. Yet even if henceforth she was to rank as a second-rate power she still succeeded in holding her own after the loss of the extraneous possessions. And although only after many years and much turmoil within was she at last to evolve a form of constitution that served her well, she did in the end evolve it, a lesser power but a sovereign one and apparently impregnable.

The part played by Poland throughout the northern war had been, to say the least, lacking in foresight. At Nystad she lost no territory. But she was so devastated by

*Peter's "Admiralty" on the Neva, enclosed within defensive ramparts, where from 1712 onwards warships for his Baltic fleet were built. These included oared galleys, easy to manoeuvre among the Finnish skerries: Russian emissaries had noted their value to Venice in narrow Adriatic waters*







National Maritime Museum

*Off the Hangö peninsula at the entrance to the Gulf of Finland the young Russian fleet, with the Tsar on board, defeated the Swedish navy on August 7, 1714 and Sweden's domination of the Baltic was at an end. The Treaty of Nystad in 1721 secured to Russia a substantial section of seacoast*

the war, so torn in two by quarrels within, as to make her an easy victim when the time came.

Lastly, among the provisions of the treaty was one as significant in its way as were the clauses that secured Russia her new frontier. The Elector of Brandenburg had fought against Charles. He received his reward. Now, as King of Prussia, he was given Stettin and those great commercial arteries the

mouths of the Oder. If Nystad indicated the advance of Russia both in actual geographical fact and as a great power, it also was a pointer towards the rise of Prussia.

Thus ended one act in the drama of Russia's westward expansion. It also began, in preparation for the next, a fresh grouping of those among her neighbours whom it most closely affected. They, and not they only but all Europe, were from now onwards compelled to look at the face which had appeared at the 'window' on the Baltic: St Petersburg, the trading port which Peter had created, forcing his subjects to accept it as the capital, requiring the upper classes, in sullen resentment, to build houses there and to live in them. Later his utilitarian conception was transformed into a city of opulence and magnificence, the creation of the Italians, Rastrelli and Quarenghi, and of the Scotsman, Cameron, working at the command of Elizabeth and Catherine. Yet always it appeared remote from, even incongruous with, that which was really Russia. It poses the eternal question: does Russia belong to the West or to the East, or to nothing but herself?



A. J. Thornton

# Hargraves' Gold Rediscovered

by ALAN BIRCH and D. S. MACMILLAN

*At the end of last year Dr Birch and Mr Macmillan, respectively Lecturer in Economic History and Archivist at the University of Sydney, found in the hitherto unsearched archives of the University the actual memorandum written by Hargraves on the occasion of his first 'strike', thereby establishing his claim—previously disputed—to be the discoverer of payable gold in Australia*

On February 12, 1851, the first discovery of payable gold was made in Australia by Edward Hammond Hargraves. "The Gold Rush" overtook the colony which had recently risen from the status of a convict settlement and, in the words of a newspaperman of that time, raised New South Wales "from a mere sheep-walk to be the second colony in the British Dominions".

There is no dispute about the revolutionary effects of the discovery of gold upon the growth of Australia. There has been, however, as one would expect, much controversy as to who was the first person to discover payable gold in that country.

Early in the 1840s, the eminent British geologist, Murchison, had declared in print that gold must exist in the colony, which had been in origin little more than an Antipodean gaol. In 1841 a local clergyman, the

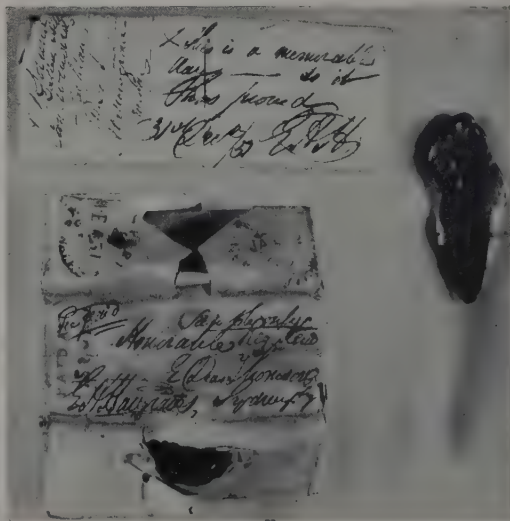
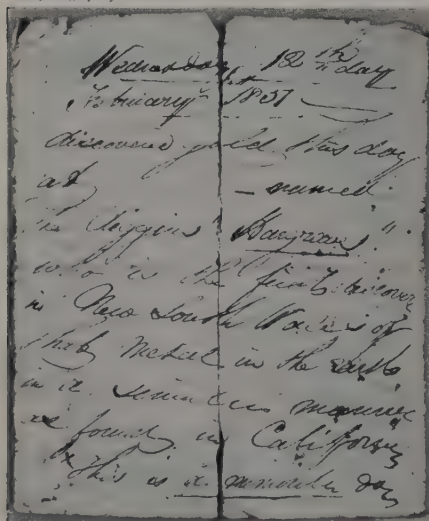
Reverend W. B. Clarke, had discovered small quantities of gold on the slopes of the Dividing Range, some miles west of Parramatta; however, for several reasons this discovery did not lead to the great mining boom, which was to come ten years later.

The credit for the effective discovery has been usually reserved by historians for Hargraves, who in 1851 in a remote valley some miles west of Bathurst sought out the gold-bearing strata of the mountains and brought his discovery to the notice of the Colonial Government. Hargraves can, in fact, be said to be the first "digger".

But even his claims have been disputed—in 1890, by a Select Committee of Enquiry at the end of Hargraves' life, and more recently by historians. Credence has been given to the counter-claims of his two companions, James Tom and John Lister, who

(Left) The memorandum written by Hargraves on February 12, 1851, describing his discovery that "memorable day" of gold near Orange, New South Wales. (Right) The endorsement and the cover under which he sent the memorandum and the flattened 695-grain nugget to the Colonial Secretary

Both photographs from the authors







Illustrated London News

*Edward Hammond Hargraves was in the news in 1851 when he discovered payable gold in Australia for the first time. In this press picture he is shown hat in hand as though acknowledging the plaudits of a grateful country. By his side is the "old horse" he rode on the eventful journey*

helped him in his searches. In April 1851, Tom and Lister did discover a four-ounce nugget of gold upon the Ophir goldfield when Hargraves was in Sydney interviewing the Colonial Secretary about his claim.

The memorandum written by Hargraves on February 12, 1851, the very day of the first 'strike', is therefore an important piece of evidence strengthening Hargraves' case as the first discoverer of payable gold in Australia.

This valuable piece of Australiana came to light when one of the present writers was examining University records lying in a strong-room. These papers had been undisturbed for many years. Among them was a small packet which, upon closer examination, proved to contain a nugget, hammered flat for sending through the post, with a letter around it. The nugget weighs nearly 700 grains. The outside cover was addressed to The Honourable E. Deas Thomson (then Colonial Secretary) and bore the Gosford and Sydney postmarks of December 31, 1851, and January 2, 1852, respectively. The words

"sample" and "registered" were inscribed on the cover.

The text of this memorandum can be clearly seen from the accompanying photograph. It records the discovery of the gold "in the earth in a similar manner as found in California"—the actual site being omitted for obvious reasons. At the end occurs the phrase "This is a memorable day", which, with the addition "so it has proved", is echoed in an endorsement initially by Hargraves and dated December 31, 1851.

Hargraves, the son of a lieutenant in the Sussex Militia, had emigrated to Australia as a lad of seventeen. Among many autobiographical details he records in his book, *Australia and its Gold Fields* (1855), written to refute contesting claims, that before he was eighteen he was a "squatter". He was "a proprietor of cows and bullocks", leading a frugal and industrious life.

The first occasion of his seeking the Eldorado which was to transform his fortunes was the Californian gold rush of 1849. He appears to have launched out from farming into



(Left) Prospectors crossing the Blue Mountains on their way from Sydney to the newly discovered goldfield at Ophir near Orange in 1851. Hargraves' discovery was an event of the first importance for the young colony and within six months 3000 men were already looking for fortunes along the banks of the creek by which he had made his find, while thousands more were on their way to join Australia's first gold-rush. (Below) The Ophir goldfield at the junction of Lewis Pond and Summerhill Creeks in New South Wales: a drawing made in 1851

From the authors





speculative building. In this venture he was unsuccessful, and as Hargraves put it, fortune had not smiled sufficiently "as to make me proof against the contagion" of the gold fever. In that year, fleeing from the threat of bankruptcy, he embarked upon the sailing ship *Elizabeth Archer* for the new goldfield in America.

He did not, however, meet with more than a modest amount of success. If we can believe his own account of his experience, "the greater our success was, the more anxious did I become to put my own persuasion to the test of the existence of gold in New South Wales".

In January 1851 he returned to Sydney to put his Californian experience to a more profitable use. He was, as he admitted, "no professed geologist" but he had taken note of the rock formations in California with which the gold-bearing ores were associated. In February he set out alone on horseback across the Blue Mountains to return to Guyong, near Orange, where he had been eighteen years previously. He arrived there on February 10 and after a day's rest took with him the son of his landlady to act as his guide in the district, setting out to follow the course of the Lewis Pond Creek, a minor tributary of the Murrumbidgee.

After travelling for some fifteen miles in this rough country, near to the junction of the stream with another, the Summerhill Creek, he decided that he had, indeed, found his goal. Hargraves was gifted with a lively sense of the memorable phrase and his account of his excitement, as he made the actual discovery, is quite amusing. "I felt myself", he observed, "surrounded by gold". He could not avoid the comparison of his situation with that of Midas and he confessed that the discovery at that moment made him "as mad as Don Quixote was his life through".

The pan and cradle, incidentally, upon this occasion as the water of the creek washed the first spadeful of the Ophir goldfield, did not yield more than five specks of the precious metal.

This, however, was sufficient for Hargraves, who confidently expected great honours and reward for himself and his companion and exclaimed: "This is a memorable day in the history of New South Wales. I shall be a baronet, you will be knighted, and my old horse will be stuffed and put in a glass case and sent to the British Museum". He set out for Sydney at once to stake his claim, while Lister accompanied by James Tom pros-

pected further, finding more appreciable amounts of gold.

In April Hargraves arrived back in Sydney and interviewed Deas Thomson. He was advised to put his claim into writing and eventually, upon the strength of the subsequent discoveries of gold, was appointed Commissioner of Crown Lands, to supervise the licensing of goldfields. He received a small reward as a token of the Government's appreciation.

By September 1851 news of Hargraves' discovery at Ophir had reached London. Letters sent by a firm of Sydney merchants, Smith, Campbell and Company, reported that already there were about 3000 men at work along the banks of Summerhill Creek. The chartering of ships, by the thousands who sought passage to this new Eldorado, filled the columns of London's shipping weeklies. The flood of fortune-seeking "diggers" which reached Australian shores in the next five years made possible the growth of a nation. Hargraves' claim in his first-day memorandum about the importance of his discovery was fully justified by the events which followed it.

Was Hargraves' memorandum written on the actual day of his momentous find? Why was its delivery delayed until the end of this, the *annus mirabilis* of Australia's eventful history?

The explanation is not complete but it has, at least, the merit of being based upon Hargraves' own account of the circumstances of his 'strike'. He wrote the memorandum, he tells us, on the evening of February 12, 1851, at the Wellington Inn, Guyong, where he was staying during his prospecting. However, he writes that afterwards he presented this document with a nugget to Deas Thomson "as a memorial of the great event". Hargraves, upon his appointment as Commissioner, was sent off on surveying expeditions to other districts as well as to the Ophir district again; he did not return to Gosford, his home, until the middle of December. This, then, was the first opportunity for him to carry out his intention.

The memorandum and the nugget of gold were meant as a souvenir and a personal gift for Deas Thomson. No trace of the receipt of the letter exists in the official correspondence of the Colonial Secretary. Deas Thomson soon afterwards became Chancellor of Sydney University and it seems likely that this valuable piece of Australian history was later given by him to the institution of which he was one of the founders.

# Indian Paintings for British Naturalists

by MILDRED ARCHER

*Four or five generations ago a passion for amateur natural history possessed the more cultivated British. It led many of their compatriots in India to commission paintings from Indian artists, whose descendants the author, while in India, has met. The Oxford University Press will shortly publish her book Indian Painting for the British, written in collaboration with her husband*

"A FLAMINGO was sent for me to look at this evening . . . it is a very curious bird. I hope to get a drawing of it." So wrote Lady Nugent in her diary when living at Calcutta in 1812 and this entry is typical of many others in the journals of intelligent men and women in India during the late 18th and early 19th centuries.

This period was perhaps the heyday of the amateur natural-historian. The subject had not yet grown too complex. Many people of intelligence—from the aristocrat to the artisan—delighted in Nature and, having assiduously collected plants, birds, animals, fish and insects, wished to investigate their form and habits. They observed their specimens curiously, painted them gracefully and described them with vivacity and clarity. By the early 19th century, such 'scientists' were energetically classifying their specimens, fitting each one into its neat pigeon-hole. Moreover, these specimens were not only interesting for their own sakes; they were also examples of 'the picturesque', a cult fervently followed by the fashionable and up-to-date. Everyone with pretensions to culture worshipped at this shrine, and the creatures and plants of their world were 'caught and fixed' on paper, along with the picturesque landscapes and human characters which exerted a similar appeal. As a result there was a great spate, not only of amateur water-colour paintings, but of handsomely illustrated books: Dr Thornton's *Temple of Flora* (1799-1804), Sowerby's *English Botany* (1799), William Daniell's *Animated Nature* (1809), and Bewick's *Quadrupeds* (1790) and *British Birds* (1797 and 1804). Here were embodied the interests and ideals of all amateurs in a perfect form.

The natural history of Britain certainly provided lavish, if perhaps somewhat sombre and restrained, material for the devotees of the sport. But how much more exciting and gorgeous was the material which suddenly

met the eyes of men and women who travelled to India and settled there. Here were birds of fantastic shape and brilliant plumage, trees luxuriating in blossom, fierce or unknown animals, varied fish and unbelievable insects. The journals of the period abound in the delighted exclamations of travellers when confronted with new and picturesque specimens. James Forbes, a Company servant who was in India from 1763-84, was excited by the Silk-Cotton Tree. "This tree is extremely curious in its growth; the branches regularly project in horizontal stages, gradually diminishing as they approach the top, forming in the Malabar woods a crimson pyramid, of singular appearance; the flower resembles a single peony, or round tulip, of bright red, succeeded by a pod, in size and shape like a plantain, green at first, but ripening to a dark brown, when it bursts open, and covers the adjoining groves with snowy flakes, light as the floating gossamer." Mrs Elwood, an army officer's wife, who visited India from 1825-1828, had seen nothing so lovely as the coconut palm, "the tall and airy cocoa, either singly dancing aloft in the air, or representing *en masse* a continuous shade, the stems resembling the pillars of a gothic cathedral . . . Nothing can exceed the beauty of the more youthful ones just throwing out its branchy leaves, with a graceful and coquettish air, like a young belle in the pride of her charms, claiming and ready to receive the homage of mankind, to her light and wavy elegance."

The study of Indian natural history became one of the main amusements of intelligent British men and women, who often lived in isolation far from other British society and the pastimes to which they had been used. Emma Roberts, that zealous adviser to women in the early 19th century, pointed out that "there are so very few methods for the employment of the time of the softer sex in India that a love of natural history opens up endless fields of pleasurable research to those who





All reproductions, except one, by courtesy of the India Office Library

"The Male Peeluck" (Pilak) or Blackheaded Oriole, *Oriolus xanthomys*. Painted for the Marquis Wellesley between 1799 and 1804







*The Indian Pitta, Pitta brachyura. Painted  
for the Marquis Wellesley between 1790 and 1804*



*Queen of Flowers, Lagerstroemia speciosa. Painted  
for the Marquis Wellesley between 1799 and 1804*





*Solanum.* Painted for the Marquis  
Wellesley between 1799 and 1804

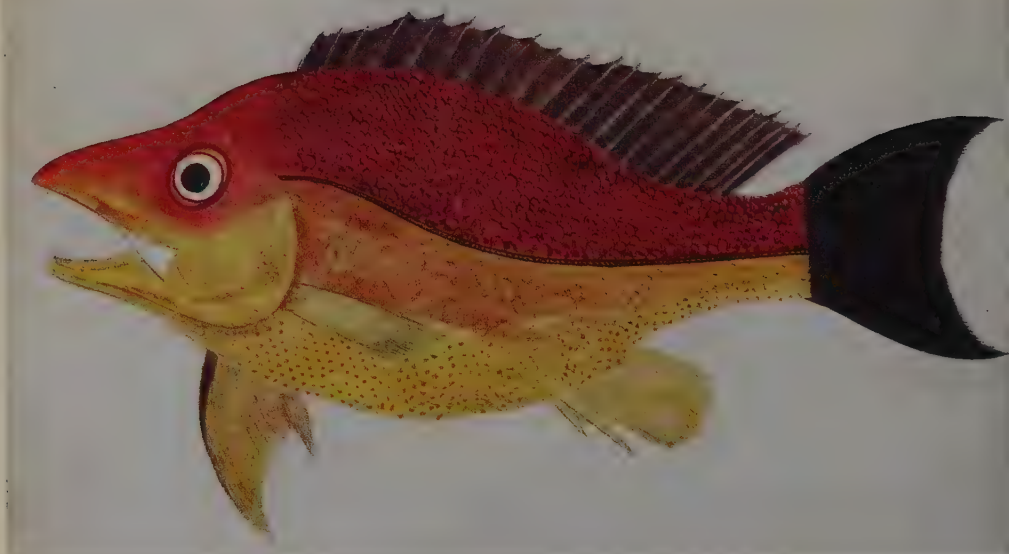


*"Tyger cat from Rohilcund" (Jungle cat), Felis chaus.  
Painted for the Marquis Wellesley between 1799 and 1804*





*Mongoose Lemur, Lemur mongoz mongoz. Painted  
for the Marquis Wellesley between 1799 and 1804*



(Above) "A Fish called Vaycunday", possibly *Lutianus gibbus*. From the Mysore Collection about 1802.  
 (Below) Soft-shelled Turtle, *Trionyx hurum*. Painted for Dr Francis Buchanan between 1803 and 1806





have enjoyed a taste for it," while for many men it was a patent duty. Patrick Russell, who gave his name to the Russell Viper, expected great improvements in natural history as a result of the British connection with India, "if ardour for enquiry continues to prevail . . . and if a spirit of scientific emulation among the Company's servants abroad, meets with such encouragement as must naturally tend to rescue many of those hours of leisure from indolent neglect, which might be employed with no less pleasure to the individual, than eventually to the public benefit." Wives accompanied husbands on arduous tours in search of specimens, while husbands had to tolerate their wives' *fièvre* at home. Mr Parks, a Company Collector in Cawnpore in 1830, writes resignedly of his wife's enthusiasms. "She is making a collection of butterflies and *coleopterae*; she is deeply read in *taxidermy*, and we have, besides, many other preserved subjects, such as tigers' and hyenas' skulls, an alligator's skeleton whole, a delightful little pet in spirits of wine, a young crocodile, skin and all. Then there is 'The Bottle of Horrors!' containing cobra de capello, scorpions, lizards, millepieds, centipeds, grillus monstrosus, and I know not what. Mephistopheles himself would be affrighted; and I, the Faust of this Margaret, am sitting in quiet unconcern, smoking my cigar, as happy as if I was one of the party in the bottle, the daily object of admiration."

But many specimens could not be put in the bottle or treated with arsenical soap. They could best be recorded by paintings, which avoided the disfiguring changes of preservation. The more talented of these natural-historians, such as James Forbes or Fanny Parks, could make their own water-colour drawings, but not everyone was so competent. Lady Nugent, as we have seen, could not paint her flamingo, but had to call in "a native artist". Fortunately, wherever the British went they could usually find an Indian artist who, deprived of wealthy Indian patronage, was delighted to carry out the commissions of these new, eccentric patrons.

As one might expect, the largest number of these natural-history paintings made by Indian artists have come from Calcutta, the capital of the Bengal Presidency, where many British patrons were assembled. Mrs Edward Wheler, the wife of a Member of the Supreme Council, who went to India in 1777, is known to have had a large collection of such pictures, a few of which are now in the Natural History Museum, South Kensington. Nathaniel Middleton of Calcutta lent Pennant, the

author of *The View of Hindostan* (1798-1800), "his great treasure of Asiatic drawings of quadrupeds, birds, fishes and vegetables." But perhaps the finest of all these collections belonged to Sir Elijah Impey, the Chief Justice of the Supreme Court and a friend of Warren Hastings. He and his wife employed several artists, "natives of Patna", Shaykh Zayn-al-Din, Ram Das and Bhawani Das, to make a vast collection for them. Many of these pictures have now disappeared, but sixty-three large folios are preserved in the Library of the Linnean Society, showing birds poised on sprays of blossom, butterflies, caterpillars and cocoons displayed on leaves, and animals posed by stumps and mossy stones.

In up-country stations of India, far from Calcutta, other zealous natural-historians were employing Indian artists. Major-General Hardwicke of the Bengal Artillery amassed a huge collection wherever he was posted between 1781 and 1823. 1500 of these drawings are now in the Natural History Museum, but many others were given away or have disappeared. Brian Houghton Hodgson softened his lonely sojourn in Nepal from 1825-1844 by employing three Indian artists to paint the rare specimens he secured in the mountains. "I have three native artists always employed in drawing from nature," he wrote to his sister. "I possess a live tiger, a wild sheep, a wild goat, four bears, three civets and three score of our beautiful pheasants. A rare menagerie. And my drawings now amount to two thousand." Many of these pictures are now in the Natural History Museum and the Library of the Zoological Society.

It was not only private individuals, however, who employed Indian artists to record the natural history of India. The Company's Directors were also interested in the flora and fauna on account of their commercial and medical possibilities. With that end in view, they established the Botanic Garden at Garden Reach, Calcutta, in 1793 and recruited a small staff of Indian painters to assist in a survey of India's natural history. Although preference was given to "subjects connected either with medicine, the arts, or manufactures" they also encouraged "the admission of new plants, or of such as have hitherto been imperfectly described, although their qualities and uses may as yet remain unexplored." Under William Roxburgh, the first Director of the Botanic Gardens from 1793 to 1813, a small team of Indian painters produced the 2500 beautiful flower-paintings

known as the Roxburgh Icones. The signatures of Gurudayal, Haludar, Vishnu Prasad and Mahangu Lal appear on some of the paintings. Various copies were made of these studies; some finding their way to Kew Gardens, others to the India Office Library in a collection "originally prepared by order of the Marquis Wellesley, when Governor-General of India". Maria Graham watched this team of artists at work when she visited the Botanic Gardens in 1810. "They are", she wrote in her journal, "the most beautiful and correct delineations of flowers I ever saw. Indeed the Hindoos excel in all minute works of this kind." Under Nathaniel Wallich (1817-1846), a successor of Roxburgh, Indian artists continued to build up the Herbarium's collection, and Wallich himself used some of these pictures to illustrate his own works. The tradition continued and in 1895 when J. D. Hooker was writing his treatise on orchids, the collection amounted to almost 7000 paintings.

As part of this official survey of India's flora and fauna, a menagerie was opened at Barrackpore in 1804 and Francis Buchanan, the Company Surgeon who had made such a name for himself as a scholar in natural history, was put in charge. Buchanan, while stationed at Baraipur in Bengal from 1798 to 1800, had studied the Ganges fishes and had paid an old Indian artist "a gold mohur a month" to paint them for him. During his great surveys of Mysore and Nepal, he had again used a painter to record the specimens he found. At the new menagerie funds were allotted for the employment of a few Indian artists to draw the specimens there, and a great collection of paintings was made between 1803 and 1806. These are now unfortunately scattered, though a part of them has reached the India Office Library. Some of these drawings were copied and extra ones made by the same group of artists for the collection of the Marquis Wellesley. Colonel Colin Mackenzie was another Company Surveyor who employed Indian artists while in the South of India from 1782 to 1810. The Mysore Drawings in the India Office Library may well have been collected by him in about 1802.

As a result, therefore, of this public and private patronage of Indian artists, a large body of careful and sensitive natural-history paintings was gradually amassed. Through being shown English pictures and books, the Indian artist, always quick to assimilate new styles, was soon able to produce paintings almost indistinguishable from their English

prototypes. The delicacy of line and attention to minute detail, which had characterized all Indian miniature painting, was well suited to this natural-history painting. William Tennant, a Company Chaplain writing between 1796 and 1800, observed that "the laborious exactness with which they imitate every feather of a bird, or the smallest fibre on the leaf of a plant, renders them valuable assistants in this department." He complains, however, that "further than this they cannot advance one step. If your bird is to be placed on a rock, or upon the branch of a tree, the draughtsman is at a stand; the object is not before him, and his imagination can supply nothing." But gradually the English patrons trained the Indian artists to add even these necessary conventions of late 18th-century natural-history painting. Soon the broken stumps, the mossy stones and the analytical diagrams appear in the Indian pictures, giving them the correct contemporary flavour.

Nowadays the importance of this careful observation and delineation is easily forgotten. The specimens then unknown or rare are now common, well photographed and preserved in numerous museums and herbariums. But in the 18th and early 19th centuries, when journeys were still long and dangerous, methods of preservation unsatisfactory and disfiguring, these paintings were of real scientific value. Many authoritative books of the period refer to them as sources. Pennant, for example, the author of *Indian Zoology* and *A History of Quadrupeds* often refers to the Impey collection. "Sir Elijah Impey and his lady gave me the most liberal access to their vast and elegant collection of drawings, made with much fidelity on the spot; to them I was indebted for permission to have several copies made by my paintress Miss Stone, taken from the most curious subjects of their cabinet." The Shawl Goat, and the Horned Turkey, now at the Linnean Society, found their way into books by Pennant and George Edwards. John Gray in his *Illustrations of Indian Zoology* (1830-1835) incorporated many of Hardwicke's paintings, while Sir John Smith in his *Exotic Botany* (1805) made use of the drawings supplied by Buchanan's old painter.

Thus the sophisticated amusement of these exiled British men and women and the humble bread-and-butter illustrations of a few Indian painters contributed to the British tradition of natural history, a tradition, which, in the part played by amateurs, is unique in scientific history.



# Kiruna:

## Sweden's Northernmost Mining Town

by NOEL WATTS



*Looking across the lake from the town of Kiruna, Sweden's chief source of iron ore, towards the Kirunavaara mine: the hill is almost divided in two by the great gash of the open-cast workings*

*All photographs except three by the author*

THE remarkable town of Kiruna lies nearly 600 miles north of Stockholm by rail. A swift electric train does the journey in twenty-two hours. As it steadily drives north to the ancient fortified town of Boden little change is noticeable in the vegetation. But as you approach the Arctic Circle the trees become smaller and soon nothing is left but the stunted birches that cover thousands of square miles of this northern countryside. There are few signs of life except for small railwaymen's villages alongside the line and occasional farms and woodsmen's encampments. Then, quite suddenly, 100 miles inside the Arctic Circle, the train runs into a large modern station complete with a first-class hotel. On the hill behind it stands Kiruna, a town of some 20,000 inhabitants. At first sight this might be one of many similar small industrial towns scattered all over the world. Taxis wait outside the station, small tramcars pass along the road and, as one ascends the hill into the town, there are shops displaying goods of all kinds and even two or three cinemas.

The impression changes when the top of the hill is reached. From this point to the

north nothing is to be seen but flat swampy land covered with small bushes and scrub. The view westwards is somewhat similar except that the horizon is dominated by a range of snow-covered mountains. It is when one looks south that the reason for the existence of such a large community in this barren and inhospitable land becomes apparent. Below the station lies a long lake and on its further shore another hill rises to a considerable height. It is split almost in half by a great gash many hundreds of feet deep and this gash is the world-famous iron-ore mine. Every person in Kiruna depends directly or indirectly on this great man-made hole for his or her living. Work goes on there day and night throughout the whole year, through the six weeks of perpetual sunshine in the summer and, more remarkably, through the long Arctic night and winter with temperatures down to  $-40^{\circ}$  Centigrade.

The presence of iron ore in the north of Sweden was first mentioned in 1696, by a clerk named Samuel Mort who lived at the village of Kengis; fifty years later a Lapp herder named Mangi pointed out some



*The large modern railway station building at Kiruna. This summer scene, with its sun-blinds and hanging baskets of flowers, gives no hint that the town lies 100 miles north of the Arctic Circle*

deposits to the governor of the province. From that time onwards a certain amount of mining was undertaken at Gallivare and other places south of Kiruna. The country was so remote and the prospect of successfully transporting ore from it so slight that little more was done to exploit the resources until 1875. By that time railways had developed and there was a reasonable prospect of moving the ore. The Swedish government set up a commission which made a complete investigation of the iron deposits in the Arctic provinces. It was this commission which named the twin hills of Kiruna, one Luossavaara, the other Kirunavaara, words which have become famous in Swedish economy. At this time no habitation of any kind, not even a Lapp settlement, existed on the site of Kiruna. The nearest Lapp settlements were in the older iron-ore district of Malmberget and Gallivare sixty miles to the south.

The commission had, in addition to surveying the deposits, to consider ways of transporting the ore to ironworks in Sweden and to

suitable ports for export. The nearest Swedish port is Lulea near Boden at the head of the Gulf of Bothnia. It is a small natural harbour capable of development but it has the great disadvantage of being icebound throughout the winter months. This meant that it could never become a large-scale exporting centre. Thus a port had to be found which was ice-free all the year round and the only likely places would be on the coast of Norway which is kept free of ice by the influence of the Gulf Stream. In the 1880s there was no suitable port and the formidable mountain barrier between Sweden and Norway made the construction of the railway a difficult undertaking. However, the eastern deposits at Gallivare were developed and an English company received a concession to construct a railway between this place and Lulea. From then on ore was regularly exported from Lulea and a small ironworks was built there.

No attempt was made to exploit the Kiruna deposits until 1890. In that year a Swedish engineer named Hjalmar Lundbolm came to



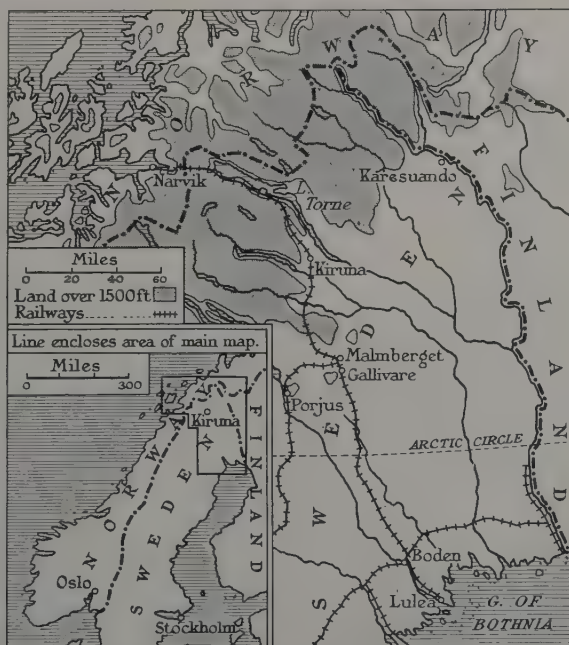
the district and the subsequent opening-up of the great deposits is very largely ascribed to his initiative and drive. He planned the mines, supervised their growth and from 1900 to 1920 managed the company. This company known as the Luossavaara-Kiruna Aktiebolaget was formed in 1890. Known throughout Sweden as L.K.A.B. (pronounced Elkabe) the company under the direction of Lundholm set about the task of producing ore with great vigour. There were three major problems to be faced. The first was that of mining the ore and making sure that facilities existed for work to continue summer and winter. Secondly a railway had to be constructed over the mountain barrier to the sea and, at the end of that railway, a port must be built capable of handling vast amounts quickly. The third problem was possibly the hardest. A town had to be built with amenities for the miners and their families sufficient to attract a labour force to this barren land and capable of giving them a reasonable standard of living and maintaining their health under very difficult conditions.

After several attempts that were abortive owing to the nature of the country the railway was extended westwards from Gallivare to the point on the Norwegian coast where the town of Narvik now stands. The feat of constructing a line over this mountain range can only be really appreciated by those who have travelled on it. It is about 100 miles from Kiruna to Narvik and of these the first seventy-five are comparatively easy. But the last twenty-five abound with difficulties. From the high plateau the line descends through great gorges, long tunnels and along the side of the cliffs of Rombaks Fjord to the quays at Narvik. The line did not reach the sea until 1902.

It is of interest to note that the development of Narvik closely followed that of Kiruna. Although they are in different countries both towns are completely dependent on each other for their prosperity; both were incorporated in 1900 and I was told by a Norwegian I met there that in those days only a small farm existed where

the busy port now stands. The farm was called Narvik and gave its name to the town. L.K.A.B. built and owned the town of Kiruna, built the port installations of Narvik and owns and runs the fleet of ocean-going ships which collect the ore there.

Except during the three short summer months life in Kiruna is hard. Some examples will give an idea of the difficulties to be overcome. For instance it is not possible to grow vegetables, so that they and all milk supplies have to be brought several hundred miles by rail: no mean consideration for a population of this size. When I arrived at Kiruna during the second week in June snow still lay in the streets and before I left in the third week in August the days were getting shorter again, there was a touch of frost in the air and already there were fine displays of the Aurora Borealis. Only the surface of the earth thaws and I was told that a yard down one would always find ice. Many people coming from the south find that they are able to live only a very few years so far north before lack of sunlight, shortages of fresh fruit and vegetables and the intense cold combine to bring on what is called 'Lapp sickness'. The only cure is to return to a more congenial climate further south.



A. J. Thornton



*(Above) Kiruna has grown up since 1900 to house the mine-workers. The railway which has made possible the development of the mines is carried on a causeway across the lake to link with the line to Narvik.  
(Below) The residential area. The standard of housing and amenities is as high as anywhere in Sweden*







Lennart N

(Above) Collecting lunch-boxes from the mine canteen: a service mainly used by bachelor employees. Milk, an important item of diet in this area of little sunshine, has to be brought to Kiruna by rail.  
(Below) The watch-tower of the fire-station. Fire is a constant danger as many buildings are wooden



There is no daylight at all for six weeks in mid-winter and the sun only begins to appear at the end of January, by which time, I was told, the people are all very pale. There is of course the compensating period in the summer when they are able to enjoy continuous daylight and spend every hour of their leisure that they can in the open air.

In order to get them to work so far north everything is done to make living-conditions as agreeable as possible for the miners and their families. Special inducements are offered including a month's holiday in the summer with cheap travel facilities. The miners are the best paid in Sweden and the standard of housing is as high as anywhere in the country. The houses are cosy and well supplied with labour-saving devices. Central-heating is universal; it is either oil-fired or electric. Electricity (which is made by water-power at Porjus sixty or so miles to the south) costs almost nothing. In order to defeat the climate all plumbing pipes are contained in a central pillar in the heart of the house. Telephones are to be found in every home

and it costs them little to speak to their relatives many hundreds of miles away in the south.

Kiruna possesses a fine hospital and there are first-class clinics for child-welfare with the latest medical advice and equipment for combating rickets and other vitamin-deficiency diseases due to lack of sunlight and fresh fruit. It also has a famous grammar school which caters for children from homes scattered throughout the Arctic provinces, to which boarders come from up to 150 miles away. One thing that impressed me was their proficiency at speaking English. I met many people in Kiruna who spoke it fluently; this is due to its being the principal foreign language taught at school and also to the fact that so many of them learnt it at study circles during the long Arctic nights. It may be, too, that they are more used to foreign languages than we are in England. It is a fact that nearly everyone I met spoke not only Swedish but Norwegian, Lappish and Finnish (the language of all the peasant farmers in this part of the country which borders closely on Finland).

*It is difficult to grow flowers or vegetables outside in the short Arctic summer; 'gardens' are limited to indoor plants which the people of Kiruna tend with care. The houses are all centrally heated and the windows—double against the cold—are designed to catch what sunlight there is*





Lennart Nilsson

*Everyone in Kiruna spends as much of their free time out of doors as they can. In addition to concerts in the park there is a football ground—football is necessarily a summer game in this high latitude—where they may forget the long months of winter in the enjoyment of a brief spell of open-air life*





*All through the winter the mines keep working, despite tremendous difficulties presented by the cold, snow, ice and darkness. Then the countless lamps are a splendid sight over the frozen lake*

Kiruna's trams were brought from Stockholm on specially constructed railway-trucks. They ply between the centre of the town and the two principal mines. Roads in the vicinity of the town are few. There are none at all to the west but there is one to the north, which runs to Karesuando on the Finnish border, and others to the east and south. Efficient bus services operate on these. I travelled to Karesuando, one of the most northerly settlements in Sweden, by one of them, a distance of 120 miles which was covered quickly and comfortably. In summer the rivers are crossed by pontoon ferry, but in winter all traffic runs over the ice and the services are maintained in spite of the intense cold.

In addition to several hotels the local amenities include cinemas (which usually show American films) and two dance halls. The summer game is football and there is a first-class ground complete with refreshment facilities and stands that will accommodate several thousand spectators. Cycling—on the few roads—and hiking through the extensive forests are also popular. The people delight in the countryside around them; its very

remoteness fascinates them and they find its Lapp inhabitants interesting. They are able to make excursions, within limits, by train: for example to the various holiday centres round Lake Torne to the north, where they may enjoy boating and fishing (also available on the many rivers), and it is possible to get to Narvik and back in a day.

Visitors are encouraged to go over the mines and are shown around without restriction. You pay a krone (about 1s. 4d.) at the mine office and join a party which is taken by funicular almost to the top of the mountain. There you alight and after walking for about a quarter of a mile through a tunnel you emerge in the mine itself.

The scale of operations is so vast that it is almost impossible to envisage what is going on. A few figures may help. In 1953-4 over 8,000,000 tons of ore and 3,500,000 tons of granite were mined. To put it another way, some 30,000 tons of ore are mined each working day and all of it is transported on the single-track electric railway to the sea, 90 per cent to Narvik and the rest to Lulea. At all hours of the day and night trains of over sixty



Above) Mining methods are simple in the open-pit workings of the Kirunavaara mine. "Vertical drills make holes in the rock, charges are inserted and detonated in groups." The sound of the blasting, which is carried out at intervals all day long, is a familiar part of life in Kiruna. Right) Looking down into the mine from above. Full-gauge railway tracks are laid right up to the heaps of ore which are loaded into trucks for weighing before being transferred by chutes to the trains that will take them to Narvik on the Norwegian coast or Lulea on the Gulf of Bothnia



trucks, each containing thirty-five tons of ore and drawn by huge electric locomotives, can be seen setting off for the ports. There is no guard's van: the last truck just carries a short brightly painted pole. All the trucks have vacuum brakes and the trains travel fast.

In the Kirunavaara mine the ore is in the form of a tilted slab shaped rather like a book placed vertically. This is two-and-a-half miles long and about 100 yards wide. The total content is estimated to have been 1,300,000,000 tons. Photographs show how the mountain has been cut right down in the fifty years of working the mine. There is still supposed to be about 60,000,000 tons available for surface working after which they will work underground. The deposit continues in a straight line under the lake and emerges on the north side at the Luossavaara mine. At present the simplest methods suffice for getting out the ore: vertical drills make holes in the rock, charges are inserted and detonated in groups. Several times a day these great explosions occur; the noise of them is a regular feature of life in Kiruna. The full-gauge

railway tracks are laid right up to the rock-face and the trucks are pushed to the heaps of ore and loaded; immediately the way is clear engineers lay new rails and install new overhead cables and all is then ready for the next blasting operation.

The only real problem is the fight against Nature. Work continues throughout the Arctic night and I was told that in winter about twice as many men are employed clearing ice and maintaining services as are needed to mine the ore. Many miles of electric wires are used to supply power and the countless lights necessary throughout the mountain in winter are a fine sight when seen from the town. The railways also have their winter troubles. At Kiruna station there is a number of snow-ploughs of every imaginable type and it is the proud boast of the railwaymen that the line is never closed by snow for more than twelve hours under the severest conditions. Snow-sheds and drift-fences help, but even with these the work must be terribly arduous.

One of the things that makes all this possible is the plentiful supply of cheap electricity. At Porjus great waterfalls drive a

*There are few roads around Kiruna, but efficient bus services ply on them to neighbouring towns and villages. In winter they cross the rivers over the ice; in summer pontoon ferries are used*







*By courtesy of Swedish State Railways*

*An iron-ore train passing through the attractive lake district on the border between Sweden and Norway, on the most northerly electric railway system in the world. Up to fourteen such trains a day leave Kiruna for Narvik; they average sixty-two trucks, each carrying thirty-five tons of ore*

hydro-electric plant which provides the mine alone with 35,000,000 kilowatts annually. In addition all the electricity for the railway and the town comes from the same source.

The mines and the company are one of Sweden's great economic assets. This was recognized by the government in 1907 when it acquired half the shares in the company and made arrangements whereby the whole of the assets could be taken over under certain conditions. The company also contributes to the country's finances by the great amount it pays in freight charges to the Swedish State Railways—£5,000,000 in 1950 for instance—and the section of the line from Lulea to Narvik is the most profitable in the whole of Sweden.

The Lapps keep very much aloof from this scene. One sees them in Kiruna in their traditional costume when they come on periodical visits to taste the joys of modern civilization, for they do not scorn its amenities if they think they will be useful. It is not at all unusual to find oneself travelling in a bus half-full of them, coming in from some remote

settlement to buy goods in the shops. It is only when you venture out of Kiruna that you realize what a very small speck it is in the vast unchanging tundra. I stayed in a Lapp village only three hours away: a few tents and turf *katas* in a small birch grove by a lake. The women and old men waited there while the younger men spent the summer in the high mountains with their reindeer. For food we ate dried, cured reindeer meat or raw and pickled fish from the lake. For dessert we had small berries which grew wild and stewed leaves of various kinds and we drank goats' milk. Bread was just a mixture of flour and water cooked in an iron pan over a smoky fire burning on the floor of a tent. At night, no matter how many people and dogs there were, all slept communally.

When I returned to the civilization of Kiruna after a week of this primitive life I marvelled even more at the enormous amount of planning and industry which had gone into making this comfortable and up-to-date mining town in the wastes of the Arctic Circle.

# The Flight of the Eagles

## I. Migration from Montenegro

by JOHN USBORNE

Pronounce c like ts; é like tch; j like y; š like sh

*This is the first of two articles in which the author describes a movement of farmers within the Yugoslav frontiers: from beautiful but infertile Montenegro to the rich plains of the Vojvodina. In Montenegro he was accompanied by a study group collecting material for a series of television programmes; this included a geologist, a botanist, an ornithologist, an artist and a historian*

MONTENEGRO or Crna Gora, call it what you like; the meaning is the same: Black Mountains. I puzzled over this alone in August last when I first saw them and I puzzled an English geologist when I showed them to him last April. On each occasion I had approached them from Dalmatia, the first time by sea, the second by the coast road. The fact is that, if any mountains are black in those regions, it is the Dalmatian Dinaries, while the more rugged chains in Montenegro, denuded to bare rock, are an ash grey which, when the sun breaks through rain-clouds, glisten white. And this, as the geologist said, is hardly surprising, since they are classic examples of white limestone formations.

"But you are wrong," protested our friend, Mirko Jovanović, "they are black. Of course our mountains are black. We call them black and that is what they are. They are black because they are dyed in the blood of our heroic people." Being more romantic than geologic, I am delighted to be bewitched; and bewitchment, after a few hours in Montenegro, is a state of mind not hard to achieve and, for days after leaving it, not easy to shed. For in all my travels no scenic beauty has affected me so deeply. To Mirko—born a humble subject of King Nikita two minutes' walk from the palace in royal Cetinje; destined to fight as a partisan in those mountains long lost to royalty, to help win them, as Comrade Jovanović, for Comrade Field-Marshal Tito (a native of the lesser mountains of Croatia); appointed after the revolution as chief guide, in his native city, to the relics of discredited royalty; and now a highly respected promoter of tourism—to Mirko foreigners who are not infatuated as I am by his country are without soul. "It is they, not our mountains, that are bloodless and white."

As complex as the patriotism of her people, Montenegro's history defies digestive clarification. Greeks, Romans, Slavs,

Venetians, Turks, Austrians, Germans and Italians, fought there God knows why for God knows what, except pride and a thousand little pockets of red earth treasured in the shoulders of gigantic infertility. No wonder these unbeatable Slavs emerged as the classic paragons of irrational tenacity. I can imagine no less likely place for human welfare than Braići, a village of rock thinly punctuated with red soil. On its factual merits I can see no reason to die for it. And yet, if one believes half of what they claim, more men of Braići in the last hundred years have died fighting than peacefully in their beds. As witness to their ferocity they point proudly to the shattered ruin of Fort Kosmač gaping down at them from a southern strategic eminence. It is usually safe to assume that a family saga of heroism in the field will have the Turk as the hated villain. "The Turk," as one of them put it to me, "we fought him all the time. He was chronic. But no Turk would have built that fort against us. He would have been dead first. No, there were those who came as friends against the Turk, as Christians with us against Islam, and fooled us. Napoleon's soldiers came through here, and here in this village we killed 3000 of them. And that left us free to deal with the Turk on our own for a few years till the Austrian came. And it was he that built Kosmač over there. Montenegro was never conquered and the Austrians took only those coastal lands down there; they said they'd come as friends to guard our Adriatic against the Turk and chase him back to where he belonged. But they made us fight our enemies instead, so we began killing them. And that's why Kosmač grew. They thought they were safe behind those rock-like walls. For about thirty years we watched each other; and then one evening a rifle shot rang out from our church and 100 metres away the Austrian commander dropped dead at the battlements. That was the signal, the



A. Monk-Jones

*Looking south-east along the Montenegrin coast from above Budva. In the foreground is the island of Sveti Nikolas. Behind it, only a few miles over the horizon, Montenegro ends and Albania begins*

beginning of the end of *that* bit of trouble."

There is hardly a village in all Montenegro that lacks such stories, hardly a family that does not claim heroic share in Montenegro's ageless struggle to remain independent. As confident of their superiority among Slavs as the Texans are among Americans, they have always been first in the defence of their fellow-Slavs. After the murder of the Archduke Ferdinand at Sarajevo in 1914, and the expiry of the ultimatum to Serbia, Montenegro was the first to declare war against the Austro-Hungarian Empire. In 1941 the first shots in the resistance against the Germans and Italians were fired in Montenegro and the Montenegrin partisans continued to maintain a vigorous initiative in the fighting.

Today all seems peaceful. Inspired by a foreign ideology to be workers rather than fighters, they turn awkwardly to road construction, to commemorating their part in the last battles by building great white Titograd out of the ruins of little grey Podgorica, to putting hotels along their unrivalled beaches. And they turn, as their ancestors

had always done between battles, to the land. It was primarily to be informed on this that I visited Budva on two occasions and travelled through the modern Montenegrin Republic into Macedonia.

Budva and its immediate neighbourhood represents a microcosm of the Montenegro of today. Situated on a small but fertile coastal strip, it is separated from the next valley strip by mountains partly covered in unprofitable *maquis* scrub but mainly eroded to the bare limestone. There is good land below, ample and compact, warm and well watered. There is good land above, but in miserably small patches. Many of these patches are laboriously extended by wall-terracing and the hauling from low land of tons of soil, bucketful by bucketful, peasant by peasant. In the *maquis* after wading painfully through trackless acres of tangled scrub one can stumble on clearings of, say, ten square yards where a boy of eight sits watching two half-starved sheep and a calf as they nibble for dear life at ailing weeds. Where does the boy belong, one asks? The sheep have surprisingly heavy fleeces, but



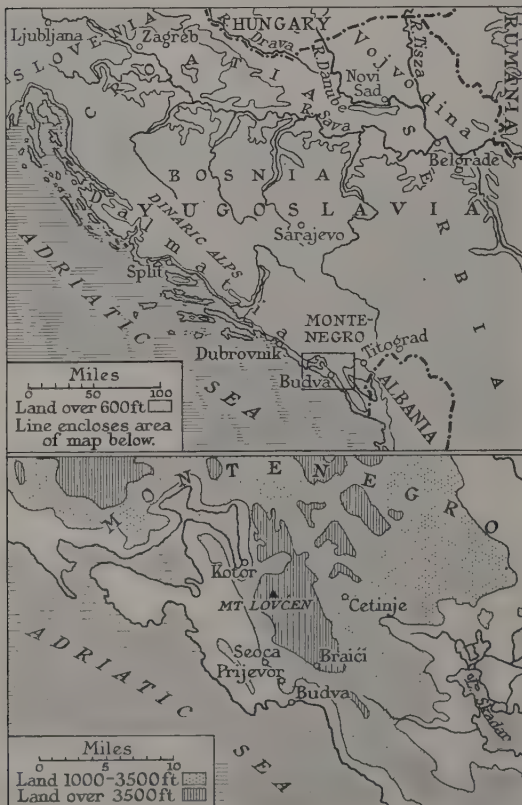
can they be in milk from such a diet and can there be anything on those bones to justify the vigilance and toil of a human family? Yet the boy seems tall and strong and, as one comes to a village one is surprised at the fine physique of almost every inhabitant.

The villages of Seoca and Prijedor above the Budva maquis remain vividly in my mind. After about an hour of hard slogging from the town, relieved by views of the Adriatic coastline indescribably beautiful, we noticed the little clearings growing more frequent and the sound of sheep-bells more insistent, until, rounding a bend in the narrow track, we saw a cluster of solidly built stone houses giving on neatly and intensively cultivated gardens. The village of Prijedor is apparently a series of small groupings and it was hard to discover which household cultivated which garden. A vine is trellised over a circular stone threshing-floor which is undoubtedly communal, as is the apiary of a dozen hives.

I questioned a girl of about eighteen, who came out to greet us with a litre carafe of red wine and little glasses of *rakija* brandy distilled from the grape. There were about eighty families in Prijedor, she told me, a good twenty or thirty families fewer than before the war. The Italians had completely destroyed the village and, chiefly from the old ruins, the present homesteads had been recreated. Many of the men had been killed, but many more had gone with their families to the Vojvodina, the great rich plain north of Belgrade and Novi Sad, near the Hungarian frontier. And some had got work on the roads or in Titograd. All the men still remaining worked down in the Radanović valley, where they grew a wide variety of produce including maize, citrus fruits, grapes, water-melons, aubergines and the commoner vegetables. No, the men never worked in the clearings round the village; that was for the womenfolk and the older children. It had always been like that.

This lively and obviously intelligent girl, whose name was Milica, then invited us into a little house which consisted of the one room, measuring about twelve feet by sixteen and containing on its bare boards little furniture except plain wooden benches and rough stools set about a wood fire whose smoke escaped through chinks in the roof. Here we were joined by several other women of the village, some wrinkled and toothless, some tolerably well preserved, but all bearing the marks of the cruelly hard life all Montenegrin peasant women still must endure today. They had come to look at us, to drink with us, to chatter and laugh, to be photographed, to enjoy a few minutes of change from the otherwise changeless routine of their harshly ordered lives.

About an hour after leaving Prijedor, we came upon Seoca. Also destroyed by the Italians in the war, it re-emerged from the ruins larger, solider and more compact than Prijedor. The menfolk here also worked in the Radanović valley, but here it was plain that, as in the valley, land and stock was managed cooperatively. For there was more of both





All photographs, except one, by T. G. Usher.

*Guarding a coast-line of rare beauty and a hinterland of tragic barrenness, Budva symbolizes much that is essentially Montenegrin. Her Roman Catholic cathedral and Serbian Orthodox church rise in defiant proximity, leaving no room for Turkish Islam that formerly pressed hard upon them both*



*Montenegrins are proud of their traditional pillbox hats and their moustaches. The wearer of these, after a hard childhood in a mountain village, emigrated to Istanbul to avoid Austrian conscription, re-emigrated to California, and returned to fight Italians and Germans. Now on pension, he can sometimes afford plum brandy and Turkish coffee at the new café outside the city walls of Budva*



*Women in the market at Budva haggling before purchase, as is the accepted Montenegrin convention. They have walked down from the villages of Seoca and Prijevor with their produce, which usually includes wine, brandy, honey and cheese. It is customary to wear mourning black for at least three years after a bereavement and often permanently. War casualties in Montenegro were devastating*



*Braići is characteristic of the eroded limestone country which makes up so much of Montenegro. The peasants remaining here after the total destruction of the village in the last war, resettlement and emigration, struggle less to subsist than did almost double the population in 1939*







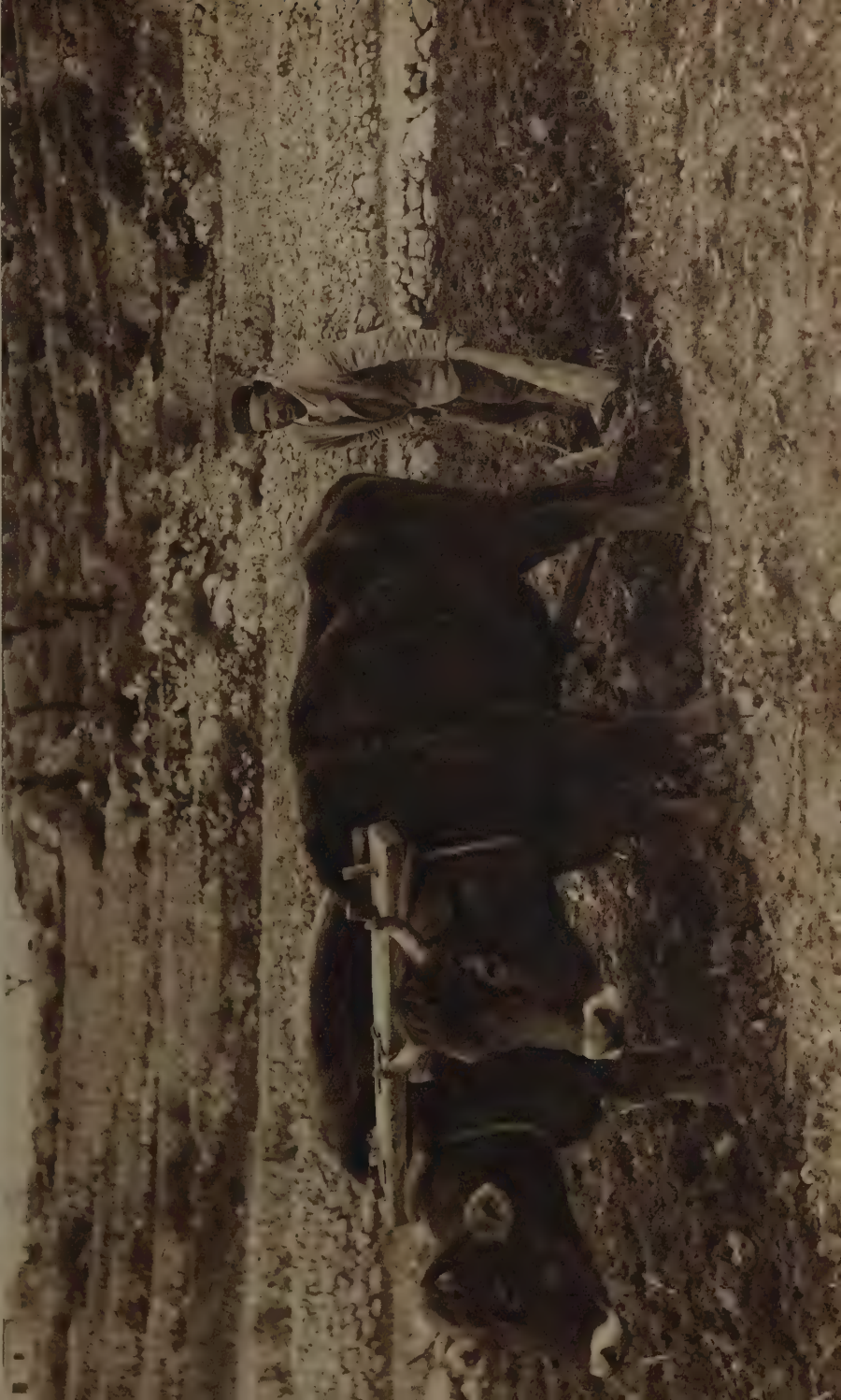
*Braiči's Orthodox church stands as a monument to the sniper who, shooting the Austrian commander of Fort Kosmać (seen in the background) from a window, inaugurated Montenegro's successful rebellion against a hated usurper in 1869, when the Montenegrins battered the fort into submission*





(Opposite:) While in a fertile valley near Buavia the menfolk tend their citrus groves and vines, their women in the maquis watch the livestock scratching a precarious existence from the eroded clearings where once coniferous forests held the soil. (Below) In Bratá every pocket of soil is wall-terraced. This peasant returned in 1947 from America, where he had grown materially rich but poor in health. Once more poor, he has regained his health and is happy

P. Bloom







*The women of Montenegro, from shouldering so much of the heavy work, age early. These two have brought their bundles of wood from maquis scrub two miles away and over a thousand feet up to sell in the city of Budva. Their menfolk, engaged on more rhythmical and less arduous tasks in the valley, retain their handsome looks into ripe old age*



and the houses were grouped in such a way as to encourage cooperative rather than individualist cultivation of the village garden. I visited several houses, in all of which I was made most welcome and where I learned of the war losses, of the resettlement of kinsfolk in the Vojvodina and, almost invariably, of the members of the family in Canada or the United States. (Later I learned from semi-official sources that in fact very few Montenegrin peasant families were not being considerably supported by gifts and funds from North American relations. It was even maintained that the government took this into account when calculating the social and other benefits due, under the system that obtains in Yugoslavia, for services rendered.)

We were struck here, as everywhere we went in Montenegro, by the appearance of the women. By tradition over the centuries, while their men fought or prepared to fight or talked about fighting or, in the interims, undertook some of the more dignified agricultural tasks, the women, as well as producing large families, have been relegated to the hard, back-breaking jobs. If they were fortunate enough to belong to a *zadruga* or village communal system, their tasks were fairly strictly defined and they gained prestige with age; they had the satisfaction of producing manpower, whether for peace or war, and being respected for it. But almost incessant physical over-exertion had always been their lot; they had aged young, while their men from earliest times had gained the reputation for being the tallest, best-looking and best-preserved men in Europe.

Today in Montenegro there are few peasant communities working according to the hierarchical system of communal self-sufficiency. Capitalist industrialization had, well before World War II, come near enough to undermine the old ideas; there had begun to emerge the magnetism of the towns, the limitation of the family and the agricultural surplus, each interacting on the other. The big village estates were split into small competitive holdings. The era of the peasant proprietor had begun and the general feeling among the older people was that the old country was the less happy and healthy for it. It is certainly conceivable that the advent of Communism was by many regarded, in the agricultural field at any rate, as a by no means regrettable reversion. Many of those who had hankered for the old system were disappointed by the new and alien forms that the return to communalism had taken. Col-

lectivism gave way, after the break with Russia in 1948, to Cooperation, where geography indicated the need for it, and today rural life in Montenegro is assuming a pattern very similar to that of the old days, with obvious differences. Families are smaller, surplus output is larger and the standard of living rises. Productivity has increased, but not enough to improve standards for both sexes. It is the man whose task grows easier and more profitable; few benefits as yet seem to reach his wife. While he may have the use of a tractor, be given improved seed and complete the picture with chemical fertilizers, she still slaves in the old way about the homestead, cutting faggots for bundles to be carried perhaps several miles on her back, carrying baskets of soil from low to high land, which she may laboriously shape into terraces, carrying vegetables and other produce to market and many other arduous tasks.

It is hard to say whether this harsh sex inequality in Montenegro will last. On balance the signs are propitious, not the least being the fact of compulsory primary education. At the moment this imposes even greater hardships on the women, in that it obliges them to add the traditional tasks of the older children to their own, while the men's remain as before in the fields. But educated and enlightened youth in such a traditional setting is bound to bring radical changes.

It would be unwise, however, to expect those changes to follow rational lines. Montenegrins do not change like other people. In Braići we visited the home of a peasant who had returned only a few years before from the United States where he and his father had acquired great wealth. He had returned at the age of about thirty-five wracked by an apparently incurable asthma. Marrying a village girl, he quickly settled back into the old ways. Though he then had plenty of money, he preferred to be materially simple to the point of stark austerity. He has a family of four small children in a very small cottage. Though his agricultural knowledge is superior to that of his neighbours and his output higher, he still uses a wooden plough and a pair of oxen, and his wife works quite as hard as the other wives of Braići. But, no longer asthmatic, his hair long in the old style, wearing the red, gold and black pillbox hat as mourning for his compatriots who died in their thousands at the hand of the Turks on the field of Kosovo in 1389, he is a very happy man.

# Change in the Thames Estuary

by BASIL E. CRACKNELL

*The sea-entrance to the world's greatest city is, and has almost always been, a strangely neglected place. Now the demands of the oil age—transitory though they must prove when oil supplies have been exhausted—are lining the estuary with vast engineering works, and holiday enjoyment is sought there by a population which greatly improved communications have rendered more mobile*

THE visitor who approaches London by river cannot fail to notice the striking transformation of the landscape which is now taking place in the Thames Estuary, and yet even the average Londoner is probably quite unaware of these developments on his own doorstep. It is true that the great flood of 1953 brought the Thames Estuary dramatically and tragically into the news, but even so it is doubtful whether many people realize that more damage and casualties were suffered there than on any other part of the East Coast.

There are probably good reasons for this lack of knowledge and interest. The Estuary margins were for many centuries little more than desolate expanses of marsh with only an occasional farmhouse or shepherd's hut to break the monotony. The Estuary was also a most unhealthy region, many of the inhabitants suffering from ague, or malaria as we would now call it. It was not a place to linger in but rather to hurry through as quickly as possible. Altogether it was a singularly dull approach to the capital city, and if people thought of it at all they probably did so in the imagery of Pip, in Charles Dickens' *Great Expectations*, who was not many years old before he discovered "that the dark wilderness beyond the churchyard intersected with dykes and mounds and gates, with scattered cattle feeding on it, was the marshes, and that the low leaden line beyond was the river, and that the distant savage lair from which the wind was rushing was the sea." Dickens loved the wild beauty of "the marsh country down by the river" and was a familiar figure in the little marsh-edge villages near his home on Gads Hill.

Today all this is rapidly changing. The sudden disappearance of the ague in the last decades of the 19th century made possible the development of the marshes, and the outward expansion of London provided the incentive. From the time of Dickens the landscape of

the Estuary has been slowly changing, and since the end of World War II the change has become a transformation. Now the "dark wilderness" is neither dark nor a wilderness; it has become an industrial region of rapidly increasing importance.

Perhaps the main reason why these changes have attracted little notice is simply that the Thames Estuary is such a difficult place to travel about in if one keeps to the land. Seawards of Tilbury there is no way of crossing the river except by boat, and the lateral roads and railways generally keep well inland. The only way to obtain a balanced picture of the Estuary is to travel along its main artery—the river; and it is as seen from the deck rail of a ship passing up-river that the region can best be described.

As the ship enters the narrower waters of the inner estuary, passing Sheerness on the one hand and Southend on the other, the first signs of industrial activity are the giant towers of the new British Petroleum oil refinery on the Isle of Grain. The refinery is built on the south-east corner of the island near Port Victoria, the secluded railway terminus on the Medway from which harassed Royalty used to embark for the Continent, thankful for the absence of cheering crowds. Now the deep-water wharf provides anchorage for the huge tankers which bring the crude oil to the refinery, and the seclusion has become a handicap since it means that workmen must either be brought from the Medway towns, about ten miles away, or provided with homes in the neighbourhood. The Isle of Grain has always been off the beaten track. Only fifty years ago there was an old man living on the island who had never been away from it during the whole of his long life. If someone else, writing about the turn of the century, had not already used the phrase "the loneliest place in the Home Counties" to describe Canvey Island, one would have been tempted to give the title to the Isle of Grain. Perhaps



National Film Ltd

*When Dickens knew the Thames Estuary it was a malaria-infested wilderness ; today gleaming oil installations and holiday resorts compete for its shores. (Above) A still from the film Great Expectations. (Below) The old railway jetty at Port Victoria decaying alongside new deep-water moorings for tankers*

*By courtesy of the British Petroleum Co.,*





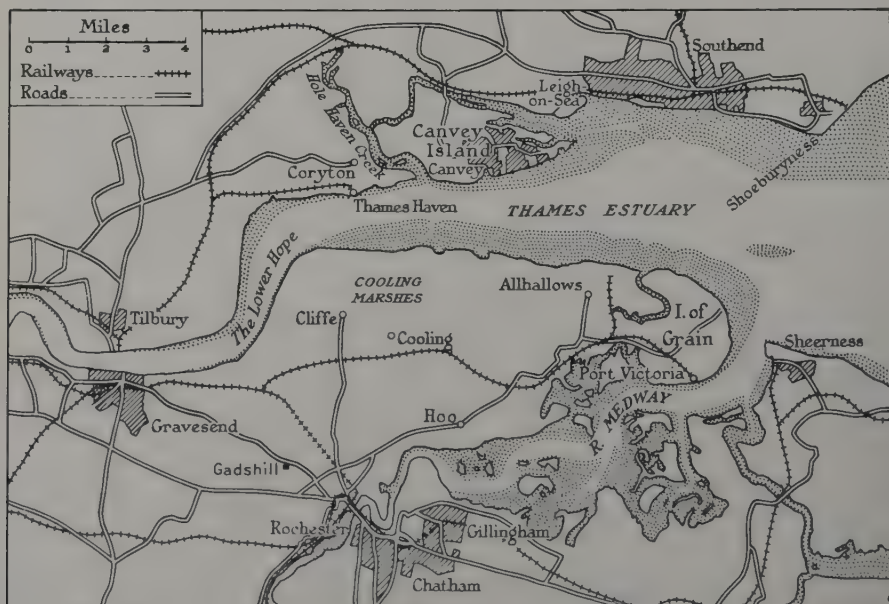
the truth is that all these Thames-side villages were equally remote despite their proximity to London. They were social backwaters on the shores of one of the world's busiest waterways.

The changing landscape of the Isle of Grain is plainly visible, but what the observer may not realize is that the very ground on which the refinery is built is also man-made. Before the oil tanks were constructed millions of tons of sand were sucked from the bed of the river and deposited on the marshes of Grain to form a stable 'floor' on which the tanks could be placed. This ingenious procedure saved the laborious sinking of thousands of concrete piles. Another striking feature of the refinery is the artificial reservoir constructed at the water's edge which is filled with water from the Medway at each high tide, so ensuring a constant supply of water. These great engineering works have finally broken the isolation of the Isle of Grain.

Just a mile or two up-river from the Isle of Grain the backbone of the Hundred of Hoo reaches the Thames at a little stretch of sandy beach known locally as "Bell's Hard", but called on the maps "Allhallows-on-Sea". Allhallows-on-Sea might just possibly have become the seaside resort its name implies if the 1939-45 War had not intervened. This short stretch of foreshore had been a favourite picnic-spot for local people long before the

advent of the motor-car when it also became a popular visiting place for Londoners. Eventually a company was set up to develop the potentialities of the place. A branch railway line was built, a fun-fair placed near the sands, and a new name was invented. At first it was proposed to call the new resort "Thamesmouth" but later more modest counsels prevailed and it was decided merely to add "on-Sea" to the name of the nearby village of Allhallows which had grown up centuries before at a sensible distance from the "aguish vapours" of the riverside. Thus the first stage was completed, but before the second stage could be launched, with its cinemas, shops and great amusement park "four times the size of the famous one at Blackpool", the war intervened and the scheme was killed. Allhallows-on-Sea will probably never become the seaside resort envisaged in those pre-war plans, but it may yet become a town of some size as more accommodation is needed for the workers at the nearby refinery.

By contrast Canvey Island, on the opposite shore of the Thames, has been a flourishing holiday resort for many years, and now has a permanent population of about 13,000 people, with a summer population of probably double that figure. This is a truly remarkable development on an island which, until the turn of the century, was one of the loneliest





*By courtesy of the Royal Corinthian Yacht Club*

*(Above) The Royal Corinthian Yacht Club house, abandoned in 1914, remained as one of the few signs of human activity on the Isle of Grain in the thirties. But not far upstream schemes were on foot (below) to make a second Blackpool at Allhallows-on-Sea; the war prevented them from being completed*

*Fox Photos Ltd*





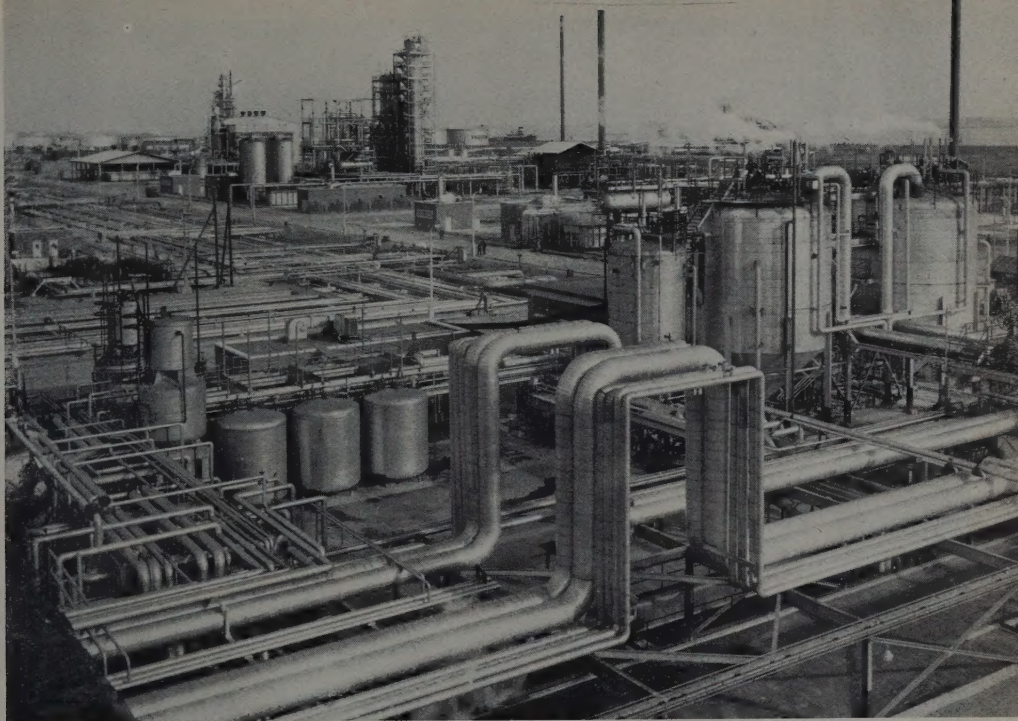
er & Holmes

(Above) Canvey is one of the pleasure resorts that have flourished for some years on the Essex side of the Estuary. (Below) The disastrous floods of 1953 caught its people unprepared for the sudden onslaught of the sea: now warned they are not likely to forget that they live below high water mark

er & Holmes







*Both pictures by courtesy of John Laing & Son*

(Above) *The Vacuum Oil Company's refinery which stretches northwards from deep water at Thames Haven to Coryton.*  
 (Right) *Putting the finishing touches to the reinforced sea-walls that safeguard the Coryton refinery. The walls, originally built by Dutch engineers in the 17th century, have been raised by two feet all round as an additional precaution against flooding. Such defences are essential to the development of the marshes along the Thames by this and other oil companies*







H. Smith

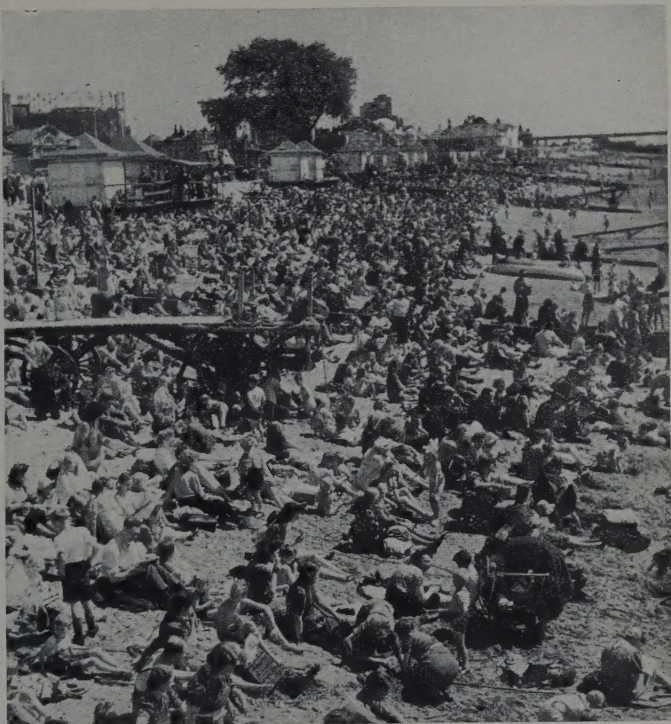
and unhealthiest places in the Estuary. The holiday-makers have had to struggle to defend Canvey Island against their chief competitors—the oil-men. In 1938, after prolonged litigation, a new oil installation was erected on the extreme western tip of Canvey Island where deep water lies within a few feet of the shore. Fortunately the oil industry and the holiday resort are able to co-exist quite peacefully because they do not compete for the same stretch of foreshore. The holiday-makers prefer the eastern end of the island where the water is shallow and the sands finest, whilst the oil tanks are situated where deep water is close inshore. The oil tanks are now accepted, but a new competitor has emerged—the sea. Of course, this is not a new challenge at all, but the people of Canvey Island had been lulled by a long period of freedom from floods into a false sense of security. The occasions in its history when their island had been totally submerged by freak storms were forgotten. When the storm of February 1, 1953, broke they were unprepared. As a result fifty-seven people lost their lives and nearly all the inhabitants had to be evacuated. Canvey has survived this catastrophe, but the

people are now acutely conscious that they live below high water mark and they are not likely to forget the lessons of those disastrous days.

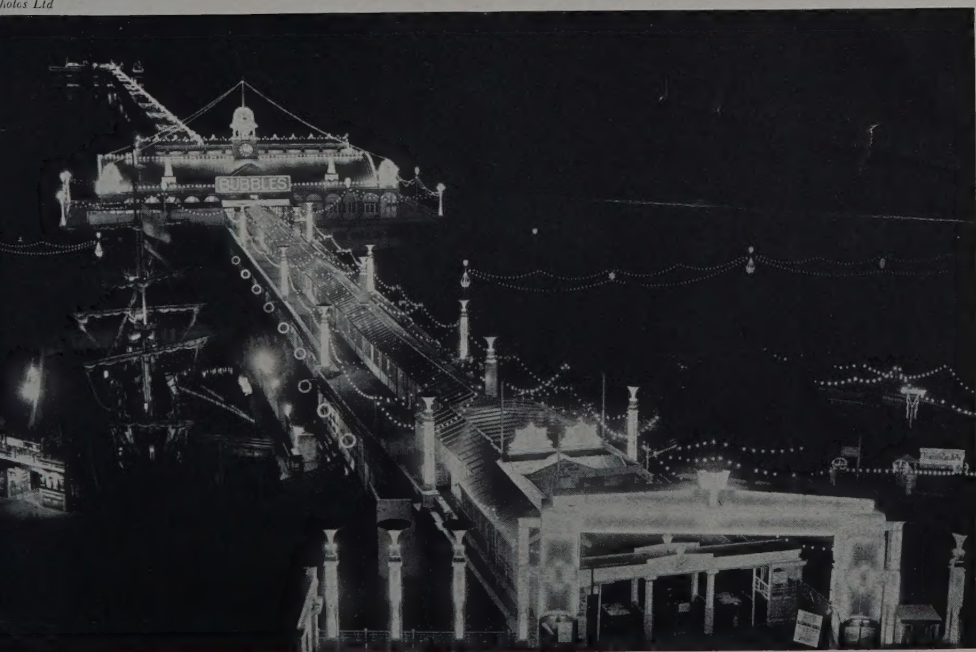
Canvey's few oil tanks fade into insignificance beside the great new oil refineries which are being established at Thames Haven and Coryton on the opposite side of Hole Haven Creek. Here is a fantastic array of oil refineries and installations which looks extremely impressive both by day and by night. A line of wharves traces the lateral extent of the all-important submarine contour along which the river bed of the Thames dives steeply downwards, enabling the great ocean-going tankers to anchor within a stone's throw of the shore. Fanning out from this vital length of foreshore is a jumbled maze of oil tanks, distillation and cracking units, offices and pump-houses, strung together with hundreds of miles of pipe-line and all gleaming silver in the sunlight. Just over fifty years ago, when these marshes were occupied only by a few isolated storage sheds, a contemporary observer wrote: "The solitary and desolate buildings of Thames Haven are a prey to the common waterside plague of corrugated iron.

Fox Photos Ltd

posite) Cockle bawleys, fish-smacks peculiar to the coasts of Essex and Kent, at anchor in the creek at South-on-Sea. This fishing village, sandwiched between Canvey Island and Southend, still retains much of its former character and is indeed the only one of its kind remaining on the Thames Estuary. (Right) Southend is by far the best and most popular holiday resort on the Estuary. Every year thousands flock there to enjoy themselves on the crowded beach or (below) on the pier, over a mile long, whose illuminations at night are a scene of dazzling brilliance



Fox Photos Ltd







in Topham

*This is where the Thames Estuary ends and London River begins: an air photograph taken from above the Lower Hope, looking over Tilbury Docks and the smoke of Thames-side factories towards London*

Corrugated iron sheds, corrugated iron roofs, corrugated iron palings—the entire place seems wholly given over to the utilitarian worship of that eminently unpicturesque deity—Corrugated Iron.” One wonders what that Victorian gentleman would think if he could see the marshes as they are today. Perhaps he would not regard the refineries as being any more picturesque but he would surely be impressed by such a remarkable concentration of industry. The Thames Estuary is now one of the biggest oil refining and storage centres in Europe.

As the ship rounds the Lower Hope, that sharp double bend which was so much more effective than the British batteries in halting the audacious advance of the Dutch up the river Thames in 1667, the oil refineries are left behind and the remainder of the journey is somewhat depressing. On both banks of the river the physical terrain is being modified by man, as on the Isle of Grain. On the north bank the level of the marshes is being raised by the tipping of London’s refuse, and on the south bank, where the marsh clay is being excavated for the manufacture of cement, there are extensive shallow pools. The

marshes now look as they might have looked if the plan which was mooted some years ago for a seaplane base had been carried out. Possibly these flooded excavations may one day serve some such useful purpose, but nothing can now restore the rich alluvial soil on which thousands of sheep used to graze.

At Tilbury the river narrows and urban London closes in on all sides: this is the end of the Estuary proper. On the north bank, just by Tilbury Ferry, there is an old inn which was there long before the nearby town and docks were constructed, and its name is “The World’s End”. It symbolizes the old remoteness of the marsh country. In the Hundred of Hoo they have a saying that “The Hundred of Hoo was the last place God made . . . and never finished,” they add cynically. This expresses the feeling of the people who live down by the river that they are cut off from the main stream of society. But today the isolation of centuries has gone, and the Thames Estuary is becoming both an important industrial region in its own right, and a busy gateway to the greatest city and port in the world.